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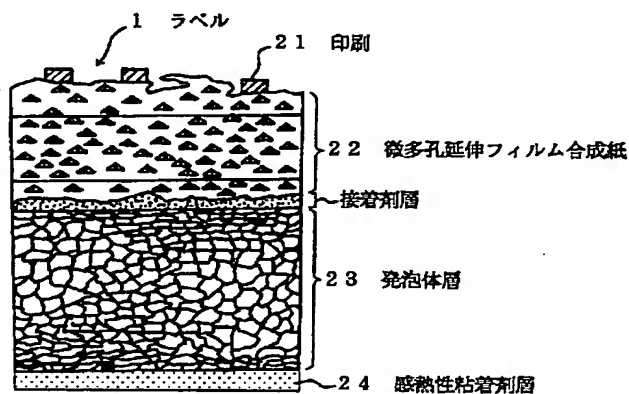
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(54)【発明の名称】 ディレード・ラベル

(57)【要約】

【目的】 ロール巻きディレード・ラベルの保管時に温度、湿度の調整が不要であり、かつ、被着材のディレード・ラベルへの貼着作業を高速とするために加熱温度を高温にしてもラベルが熱収縮を生じず、かつ、このディレード・ラベルが缶や瓶に貼着された場合には、このラベルの部分を購買者が手でつかめば、熱さを感じることはないディレード・ラベルを提供する。

【構成】 表面に印刷が施こされた無機微細粉末を含有する熱可塑性樹脂フィルムの延伸物よりなる微多孔性合成紙の裏面に発泡体層が積層され、更にその発泡体層の裏面に感熱性粘着剤層を設けたディレード・ラベル。



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## 【特許請求の範囲】

【請求項1】 表面に印刷が施こされた無機微細粉末を含有する熱可塑性樹脂フィルム of 延伸物よりなる微多孔性合成紙の裏面に発泡体層が積層され、更にその発泡体層の裏面に感熱性粘着剤層を設けたディレード・ラベル。

【請求項2】 合成紙が、プロピレン系樹脂フィルム of 二軸延伸フィルムよりなる微多孔性フィルムを基層

(A) とし、平均粒径が  $0.05 \sim 3 \mu\text{m}$  の無機微細粉末を  $8 \sim 55$  重量% 含有するプロピレン系樹脂フィルム of 一軸延伸フィルムよりなる微多孔性の表面層 (B) とする空孔率が  $5 \sim 35\%$  の積層フィルムであって、印刷が施される該表面層 (B) が次の①～③の条件を満足するものであるディレード・ラベル。

① JIS B0601で測定した中心面平均粗さ (S Ra) が  $0.20 \sim 0.38 \mu\text{m}$ 、中心面山高さ (SRp) が  $3.0 \sim 8.5 \mu\text{m}$ 、中心面谷深さ (SRv) が  $2.0 \sim 4.0 \mu\text{m}$  の粗さである。

② JIS P8119で測定される表面平滑度 (ベック指数) が  $400 \sim 1,200$  秒である。

③ 縦方向の表面強度が  $1 \sim 10 \text{ kg} \cdot \text{cm}$  である。

【請求項3】 発泡体層が、肉厚が  $0.5 \sim 3 \text{ mm}$ 、発泡倍率が  $1.1 \sim 5$  倍、独立気泡率が  $65\%$  以上の熱可塑性樹脂の押出发泡フィルム、又は、肉厚が  $0.1 \sim 2 \text{ mm}$  の発泡インキ層である請求項1記載のディレード・ラベル。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】 本発明は、日本酒缶、日本酒瓶、コーヒー缶、茶缶等の熱い液体等の内容物を収容する容器等の包装容器に加熱して融着させるのに用いるディレード・ラベル (タック・シールも含む) に関する。

## 【0002】

【従来の技術】 表面に商品、商品名、製造元、価格等の図柄や文字が印刷された基材シートの裏面に感圧粘着剤を設け、更にこの粘着剤表面を離型紙で被覆した感圧着ラベルは公知である。この感圧着ラベルは、保管に便利であるがこれを容器に貼着する際、離型紙をラベルより剥す必要があり、又、その離型紙の処分に労力がかかり、またこの感圧着ラベルをロール巻きにした場合は離型紙の肉厚の分だけ巻きロール径が大きくなる。

【0003】 かかる欠点を改良したものとして基材シートの裏面に常温 ( $10 \sim 30^\circ\text{C}$ ) では粘着性を示さない感熱性粘着剤を塗布し、反対面に印刷を施したディレード・ラベル (感熱性粘着ラベル) が提案され、実用化されている (特公平5-18433号公報、特開平1-222290号公報、同4-72125号公報、同5-32241号公報、同6-27881号公報、同6-100847号公報、同6-100848号公報参照)。基材シートとしては、パルプ抄造紙、レーヨン抄造紙、ビ

グメント塗工紙、合成紙が例示されている。

【0004】 このディレード・ラベルの感熱性粘着剤は、常温では粘着性を示さず、加熱されて粘着性が活性化されるものである。このディレード・ラベルは例えば図1に示すラベリングマシンを用いて容器に貼合される。具体的には、ロール巻きされたディレード・ラベル (1) はラベル繰出部 (2) より送りローラー (3) と圧着ローラー (4) により挟まれ、これらローラー (3)、(4) の回転により繰り出され、光センサー (5) によりディレード・ラベルの位置を確認し、ラベルをダイカットロール (6) と吸引孔を有するアンビル (7) 間でラベル寸法にカッティングされ、カッティングされたラベル (8) はアンビル (7) に吸引され移送ドラム (10) の方向に送られる。 (9) はラベルが切り抜かれたスクラップである。

【0005】 移送ドラム (10) は、アンビル (7) からラベル (8) を移し取り、加熱機構 (11) により  $80 \sim 100^\circ\text{C}$  に加熱されてラベル (8) の感熱性粘着剤が活性を帯び、容器搬送機構 (12) により送られてきた容器 (13) の胴部にラベルを貼着させる。これらディレード・ラベルは、常温では粘着性を示さず、加熱により感熱性粘着層が活性化するものであり、従って、容器、金属板、織布、ガラス板等の被着材に貼着させた際の接着力が高いことと、ロール巻きして保管し、これを被着材にラベラーマシンを用いて貼着する際にブロッキングがなく巻き戻しが容易で、かつ、この感熱性粘着剤層によりディレード・ラベルの印刷が剥離されないことが要求される。

【0006】 従って、ロール巻きされたディレード・ラベルはこのブロッキングを防止するために6月～9月の気温が  $30^\circ\text{C}$  を越えることがある季節には、保管場所の部屋温度を  $10 \sim 20^\circ\text{C}$  の温度に、かつ、湿度を  $35 \sim 60\%$  に調節して保管している。部屋温度が  $35 \sim 50^\circ\text{C}$  と高温となるとブロッキングが生じ、巻き戻し時に印刷の一部が剥れ、また、基材への接着力が湿度に影響されるからである。基材シートがパルプ抄造紙、レーヨンファイバー抄造紙のように吸湿性があるときは、特に湿度のコントロールが必要である。

【0007】 一方、お燗に使用される日本酒のガラスビン、スチール缶、アルミニウム缶、 $85 \sim 90^\circ\text{C}$  に加熱されたコーヒー、紅茶、おかゆを収納した金属缶の容器表面には、商品の図柄、製造元、取扱法等が印刷されている。このホット飲料の缶や瓶を手で持ち、飲もうとする購買者のうち、ある者は手に熱を感じるため、ハンカチで缶や瓶を覆ってつかみ、飲んでいる。

## 【0008】

【発明が解決しようとする課題】 本発明は、ロール巻きディレード・ラベルの保管時において温度、湿度の調整が不要であり、かつ、被着材のディレード・ラベルへの貼着作業を高速とするために加熱温度を  $100 \sim 125$

℃の高温にしてもラベルが熱収縮を生じず、かつ、このディレード・ラベルが缶や瓶に貼着された場合には、このラベルの部分を購買者が手でつかめば、熱さを感じることはないディレード・ラベルの提供を目的とする。

【0009】

【課題を解決するための手段】本発明は、表面に印刷が施された無機微細粉末を含有する熱可塑性樹脂フィルム

の延伸物よりなる微多孔性合成紙の裏面に発泡体層が積層され、更にその発泡体層の裏面に感熱性粘着剤層を設けたディレード・ラベル、を提供するものである。

【0010】

【作用】ラベルの印刷される表面の状態を、印刷性を損わずに、ブロッキングが防止されるような平滑度、表面粗さに調整し、かつロール状ディレード・ラベルの巻き戻し時の感熱性粘着層の粘着力では印刷が剥離しないような表面強度を有する基材シートを用いたので、印刷向上のための無機微細粉末を含有したラベルであっても紙粉トラブルが生じない。また、このディレード・ラベルは、合成紙の微細なマイクロポイドと、発泡体層の存在により断熱性を有している

ので、このラベルが貼着されたホット飲料缶や瓶を手でつかんでも熱く感じない。

【0011】（発明の概要）

#### 合成紙

表面に印刷が施される無機微細粉末を含有する熱可塑性樹脂フィルム延伸物よりなる微多孔性合成紙としては、例えば、次に示す（イ）、または（ロ）のものが挙げられる。

（イ）無機微細粉末を8～45重量%の割合で含有する微多孔を有する熱可塑性樹脂の二軸延伸フィルム（特公昭54-31032号公報、米国特許第3775521号明細書、米国特許第3758661号明細書、米国特許第3844865号明細書、米国特許第4303708号明細書等）。

【0012】（ロ）無機微細粉末を5～80重量%含有する二軸延プロピレン系樹脂フィルムを基材層（1a）とし、無機微細粉末を8～65重量%含有するプロピレン系樹脂の一軸延伸フィルム紙状層（1b）とする合成紙（特公昭46-40794号公報、特開昭57-149363号公報、特開昭57-181829号公報等参照）。

【0013】この合成紙は、2層構造であっても、基材層および表裏面の一軸延伸フィルムの紙状層が存在する三層構造（特公昭46-40794号公報）であっても、紙状層と基材層間に他の樹脂フィルム層が存在する3層～7層の合成紙（特公昭50-29738号公報、特開昭57-149363号公報、特開昭56-126155号公報、特開昭57-181829号公報）であっても、裏面がエチレン・アクリル酸メチル共重合体、エチレン・（メタ）アクリル酸共重合体の金属塩（Na、Li、Zn、K）、塩素化ポリエチレン等の基材層

樹脂よりも低融点の樹脂よりなるヒートシール層を有する三層以上の合成紙であってもよい（特公平3-13973号公報）。

【0014】また、この合成紙の表面に更にオフセット印刷性を向上させるために、ポリエチレンイミン、ポリ（エチレンイミン-尿素）、ポリアミンポリアミドのエチレンイミド付加物、ポリアミンポリアミドのエピクロルヒドリン付加物、三級乃至四級窒素含有アクリル系樹脂からなる群から選ばれた水溶性の印刷性を改善する塗布層を設けてもよい。

【0015】三層構造の合成紙の一例は、無機微細粉末を5～40重量%含有する熱可塑性樹脂フィルムを、該樹脂の融点より低い温度で一方向に延伸して得られる一軸方向に配向したフィルムの両面に、無機微細粉末を8～65重量%含有する熱可塑性樹脂の熔融フィルムを積層し、次いで前記方向と直角の方向にこの積層フィルムを延伸することにより得られる紙状層が一軸方向に配向し、微細な空隙を多数有するフィルムであり、基材層は二軸方向に配向した積層構造物である。勿論、この表面に前記プライマー（塗布剤）の層を設けてオフセット印刷性をより向上させてもよく、二軸延伸フィルムの基材層（1a）は合成紙の縦と横の強度バランスの付与に寄与し、また、紙状層の一軸延伸フィルム（1b、1c）は紙的風合いを呈する。

【0016】これらの合成紙の中でも、無機微細粉末8～40重量%含有するプロピレン系樹脂フィルムの二軸延伸フィルムよりなる微多孔性フィルムを基材層（A）とし、平均粒径が0.05～3μmの無機微細粉末を0～55重量%含有するプロピレン系樹脂フィルムの一軸延伸物からなる表面層（B）とする空孔率が5～35%の積層フィルムであって、印刷が施される該表面層（B）が次の①～③の条件を満足するものである合成紙が耐熱性、経済性、防水性、抗ブロッキング性の面から好ましい。

【0017】① JIS B0601で測定した中心面平均粗さ（Sra）が0.20～0.38μm、中心面山高さ（SRp）が3.0～8.5μm、中心面谷深さ（SRv）が2.0～4.0μmの粗さである。

② JIS P8119で測定される表面平滑度（ベック指数）が400～1,200秒である。

③ 縦方向の表面強度が1～10kg・cmである。

【0018】熱可塑性樹脂としては、融点が120℃以上である高密度ポリエチレン、プロピレン系樹脂、ポリエチレンテレフタレート、ポリアミド、ポリカーボネート等が挙げられるが、経済性の面から高密度ポリエチレン、プロピレン系樹脂が好ましい。かかるプロピレン系樹脂としては、プロピレン単独重合体、プロピレン・エチレン共重合体、プロピレン・ブテン-1共重合体、プロピレン・エチレン・ブテン-1共重合体、プロピレン・4-メチルペンテン-1共重合体、プロピレン・3-

メチルペンテン-1共重合体等が挙げられる。共重合体はランダム共重合体であっても、ブロック共重合体であってもよい。

【0019】これらプロピレン系樹脂に延伸性を良好とするためポリエチレン、ポリスチレン、エチレン・酢酸ビニル共重合体等のポリプロピレンよりも融点が高い樹脂を3~25重量%配合してもよい。また、無機微細粉末としては、炭酸カルシウム、焼成クレイ、シリカ、けいそう土、タルク、酸化チタン、硫酸バリウム等、粒径が0.03~3μmのものが使用される。基層(A)の無機微細粉末の含有量は8~40重量%、好ましくは15~33重量%であり、表面層(B)のその含有量は0~55重量%、好ましくは8~30重量%である。表面層の無機微細粉末の含有量が少ないときは、表面層

(B)の肉厚を0.5~3μmとし、基層(A)に存在する無機微細粉末の影響で粗面となっている基層(A)の表面の凹凸の形状が表面層(B)の表面に凹凸が転写されるようにする。

【0020】延伸倍率は縦、横方向とも4~10倍が好ましく、延伸温度は熱可塑性樹脂の融点よりも3~30℃低い温度である。この合成紙は、フィルム内部に微細なボイドを多数有する延伸熱可塑性樹脂フィルムである。このボイドの存在および発泡体層の存在によりラベルが断熱性を有し、ラベリングマシンの加熱機構(11)でディレード・ラベルが加熱されても熱収縮を生じない。なお、合成紙の微細なボイドの量は、次式で算出される空孔率で5~35%、好ましくは5~25%である。

【0021】

【式1】

$$\text{空孔率 (\%)} = \frac{\rho_0 - \rho}{\rho_0} \times 100$$

$\rho_0$  : 延伸前のフィルムの密度

$\rho$  : 延伸後のフィルムの密度

【0022】この基材シートは、基層(A)の両面に表面層(B)が設けられた三層構造の積層フィルムであってもよく、又、基層(A)と表面層(B)間に他の樹脂層が存在したものであってもよい。更に、表面層には、オフセット印刷性を良好とするために、或いはラベルに帯電防止性を付与するためにポリエチレンイミン、ポリ(エチレンイミン-尿素)、ポリアミンポリアミドのエチレンイミン付加物、ポリアミンポリアミドのエピクロルヒドリン付加物、三級乃至四級窒素含有アクリル系樹脂からなる群より選ばれた水溶性のプライマーを塗布したものであってもよい。

【0023】プライマーの肉厚は0.2~5μmである。又、基層(A)の肉厚は30~120μm、表面層

(B)の肉厚は0.5~50μmであり、基材シートの肉厚は50~150μm、好ましくは60~120μmである。基材シートの表面層(B)の表面粗さ①はミクロ的視野での標示パラメータで、表面平滑度②(秒数が大きいほどより平滑性に優れる)はマクロ的視野での標示パラメータである。

【0024】中心面平均粗さ(SRa)が0.20μm未満、中心面山高さ(SRa)が3.0μm未満、ベック指数が1.200秒以上ではロール巻きしたディレード・ラベルを巻き戻すときのブロッキング防止効果が小さいので、従来通り、ロール巻きラベルを20℃以下の温度で保管する必要がある、従来品と比較してメリットがない。

【0025】SRaが0.38μmを越える、SRpが8.5μmを越える、或いはベック指数が400秒未満では紙粉トラブル(無機微細粉末の基材シートからの脱落)の防止効果が十分でなく、ロール巻きディレード・ラベル巻き戻し時に印刷に白抜けが見受けられる。中心面谷深さ(SRv)は、上記中心面高さ(SRp)、中心面平均粗さ(SRa)とベック指数の値が定まると大体0.20~4.0μmの間の数値となる。

【0026】表面層(B)の無機微細粉末の含量が多いと、または表面層が二軸延伸フィルムであると表面強度が低く、ロール巻きされたディレード・ラベルの巻き戻し時に感熱性粘着層の粘着力により印刷が基材シートから剥離することがあるので、表面層(B)の表面強度を縦方向、横方向とも1kg/cm<sup>2</sup>以上となるようにする。表面強度は、樹脂の種類、無機微細粉末の種類、平均粒径、粒度分布、含有量、延伸温度、延伸倍率等に依存する。又、基材シート製造後のロールにより表面を圧縮して基材シート表面をより平滑にするカレンダーがけの条件にも左右される。

【0027】この表面強度は、熊谷理機工業(株)のインターナルボンドテスターを用い、基材シートの試料(14)(縦25.4mm、横45mm)の表裏面の中央に、幅18mmの住友スリーエム(株)製粘着テープ“スコッチ・クリアーテープ”(商品名)(15)、(15')を端側15mmは接着させないで接着したものを試料とし、これを図2に示すように①インターナルボンドテスターのホルダー16上に固定し(図2a)、これを別の粘着テープ(15")で固定し、その上にアルミアングル(17)をのせた後、粘着テープ(15)をアルミアングル(17)上に図2bに示すように曲げ、更に別の粘着テープ(15")で固定し、試料に1kgの荷重を1分かける。②ついで、零位置の調整を行ったのち重錘をつけた振子(18)を押しボタンを押すことにより90度の角度より振り下し(図2b)、アルミアングルに衝撃を加えて試料の一部(15)をアルミアングルと共に剥離させた際の針(19)が示したエネルギーの値をスケール(20)により読み取った値

である。

【0028】この表面強度が $1\text{ kg}\cdot\text{cm}$ 未満ではラベリングマシンを用いてディレード・ラベルを被着材に貼着させる際、印刷部分の一部が皮となってラベルから剥れる皮むけ現象が起こる。 $10\text{ kg}\cdot\text{cm}$ 以上とすることは、表面層の素材からみて困難である。

#### 【0029】発泡体層

合成紙の裏面に積層される発泡体層としては、例えば、肉厚が $0.5\sim 5$ 倍、独立気泡率が $65\%$ 以上の熱可塑性樹脂の押出發泡フィルム、または、肉厚が $0.1\sim 2$  mmの発泡インキ層、カーベットのバックングに用いられる発泡ラテックス層が挙げられる。上記押出發泡フィルムは、ポリエチレン、ポリプロピレン、ポリスチレン、エチレン・酢酸ビニル共重合体、ハイインパクトポリスチレン、ポリ塩化ビニル、ABS等の融点もしくは軟化点が $180^\circ\text{C}$ 以下(DSCのピーク温度)の熱可塑性樹脂に化学発泡剤又は物理発泡剤、必要により無機微細粉末を含有した熱可塑性樹脂組成物を押出機で熔融・混練し、Tダイ又はサーキュラーダイよりフィルム状に押出發泡させ、これを冷却して製造したものである。

【0030】発泡剤としては、化学発泡剤及び物理発泡剤があり、前者の化学発泡剤としては、アゾジカルンアミド、アゾビスイソブチロニトリル、ジアゾアミノベンゼン、N, N'-ジニトロソペンタメチレンテトラミン、N, N'-ジメチル-N, N'-ジニトロテレフタルアミド、ベンゼンスルホニルヒドラジド、重炭酸水素ナトリウム塩、クエン酸モノナトリウム塩等及びこれらの混合物を挙げることができる。これらは樹脂に対して $0.1\sim 3$ 重量%の割合で用いられる。また、後者の物理発泡剤としては、ブタン、プロパン、ペンタン等の炭化水素が用いられる、これらは、樹脂成分に対して $15\sim 40$ 重量%の割合で用いられる。

【0031】無機微細粉末としては、粒径が一般に $0.05\sim 30\mu\text{m}$ 、好ましくは $0.5\sim 10\mu\text{m}$ の炭酸カルシウム、炭酸マグネシウム、水酸化カルシウム、水酸化マグネシウム、水酸化アルミニウム、燐酸アルミニウム、タルク、マイカ、クレイ、カーボンブラック、グラファイト、ゼオライト、硫酸バリウム、含水珪酸カルシウム、珪藻土、酸化チタン、硫酸アルミニウム、シリカ等を挙げることができる。無機微細粉末は、樹脂成分に対して $55$ 重量%以下の割合で用いられる。なお、押出發泡フィルム成形用樹脂組成物には、上記配合剤の他に、酸化防止剤、着色剤、紫外線吸収剤、帯電防止剤、分散剤、核剤、可塑剤及び脂肪酸金属塩、脂肪酸アミドのスリップ剤等の添加剤を必要に応じて添加しても良い。

#### 【0032】発泡体層を構成する押出發泡フィルム

(a)の肉厚は $0.5\sim 3$  mm、好ましくは $0.5\sim 2$  mmであり、 $0.5$  mm未満の押出發泡フィルムを製造することは現在の技術では困難であり、又、押出發泡フ

ィルム(a)の肉厚が薄すぎでは断熱効果が乏しく、容器内が緑茶、紅茶、コーヒーのようなホット飲料を収容するときは手で容器をつかむことができない。更に、肉厚が $3$  mmを越えてはラベルのコストが高くなりすぎる。

【0033】発泡押出フィルムの発泡倍率は、 $1.1\sim 5$ 倍、好ましくは $1.5\sim 3$ 倍であり、発泡倍率が低いとラベルの弾性回復率が小となり、ラベルと中空容器、金属容器との接着力が低くなり、逆に発泡倍率が高すぎるとラベルの供給が困難となる。この押出發泡フィルムは、通常、独立気泡の発泡体と言われるためには独立気泡が $65\%$ 以上であることが必要である。独立気泡率であることによりラベルの弾性回復率、剛性が高く、ラベルの供給が容易となる。

【0034】発泡インキ層としては、発泡用原料(炭素生成材料および発泡剤)、着色顔料およびビヒクルよりなる発泡性インキを塗工、または噴射して得られるものである。炭素生成原料としては、澱粉、デキストリン、砂糖等の炭化水素、モノー、ジー、トリーペンタエリスリトール、グリセリン等の多価アルコール、尿素樹脂、メラミン樹脂、ポリウレタン、エポキシ樹脂等の樹脂が、発泡剤としては、炭酸ガス、フレオン、リン酸アンモニウム、ポリリン酸アンモニウム、ジシアンジアミド、尿素、メラミン、グアニジン、塩化パラフィン等が、着色顔料としては、酸化チタン、鉛黄、アンバー、鉄黒等が、ビヒクルとしては、ポリ酢酸ビニル、アクリル酸アルキル、エステル系樹脂、スチレン・アクリル酸アルキルエステル共重合体等の水性エマルジョンや、アルキド樹脂、ポリ塩化ビニル、ウレタン樹脂、エポキシ樹脂等をメチルエチルケトン、トルエン等の溶剤に溶解したものが使用される。

【0035】カーベットのバックング剤に用いられるフォームバックングも又発泡体層の形成剤として利用できる。このものはSBRラテックスと天然ゴムラテックスの混合物にオレイン酸カリウムのような起泡剤、トリメンベースのような泡安定剤、メルカプトベンゾチアゾール亜鉛塩やジエチルジチオカルバミン酸亜鉛塩のような促進剤、クレイ、水酸化アルミニウム、炭酸カルシウムのような充填剤を含むA剤と、亜鉛華、イオウ等の加硫剤を含むB剤と、酢酸アンモニウム濃縮様なゲル化剤を含むC剤よりなり、A剤にB剤を添加したものを発泡機で攪拌して発泡させ、更にこれにC剤を加えた後、合成紙の裏面上に塗布し、独立した微細な気泡よりなる肉厚 $1\sim 5$  mmの発泡体層を形成させる。

#### 【0036】感熱性粘着剤層

感熱性粘着剤層は、前述の公報群に示されるように、

(a) ポリ酢酸ビニル、ポリメタクリル酸n-ブチル、酸化ビニル-塩化ビニリデン共重合体、天然ゴム、酢酸ビニル-アクリル酸2-エチルヘキシル共重合体、酢酸ビニル-エチレン共重合体、ビニルピロリドン-スチレ

ン共重合体、スチレン-ブタジエンラバー、ブチルラバー、ビニルピリドン-アクリル酸エチル共重合体、等のガラス転移点が20℃以下の高分子樹脂と、(b)フタル酸ジフェニル、フタル酸ジヘキシル、フタル酸ジシクロヘキシル、フタル酸ビヒドロアビエチル、イソフタル酸ジメチル、安息香酸スクロース、二安息香酸エチレングリコール、三安息香酸トリメチロールエタン、三安息香酸グリセリド、四安息香酸ペンタエリトリット、八酢酸スクロース、クエン酸トリシクロヘキシル、N-シクロヘキシル-p-トリエンシルホンアミド、等の常温で固体の可塑剤と、(c)ロジン誘導体(ロジン、重合ロジン、水添ロジン及びそれらのグリセリン、ペンタエリスリトール等とのエステル、樹脂酸ダイマー等)テルペン樹脂系、石油樹脂系、フェノール樹脂系、キシレン樹脂系、等の粘着性付与剤を含有するものであり、常温(10~25℃)では粘着性を示さず、加熱(80~130℃)により活性を示し、加熱を止めてもしばらく(5秒~2週間)は粘着性を示すものである。

【0037】必要により、老化防止剤やコロイダルシリカ、アルミナゾル等を配合することもある。基材シートに塗布する感熱性粘着剤の塗布量は、被着材の材質、基材シートの肉厚によるが、8~30g/m<sup>2</sup>(固型分量)の範囲である。

#### 【0038】印刷

合成紙の表面に、商品名、商品の成分、単価、製造元、商品の図柄等がグラビア印刷、スクリーン印刷、オフセット印刷、フレキソ印刷等で行われる。印刷はラベルの裏面に感熱性粘着剤層が設けられた後に行われるのが一般であるが、ラベルに印刷を施こした後、裏面に発泡体層と感熱性粘着層を形成させてもよい。

#### 【0039】

【実施例】以下実施例により本発明を更に詳細に説明する。

#### 合成紙の製造例

##### 例 1

(1)メルトフローレート(MFR)0.8g/10分のポリプロピレン81重量%に、高密度ポリエチレン3重量%及び平均粒径1.5μmの炭酸カルシウム16重量%を混合した基層用組成物(A)を270℃に設定した押出機にて混練した後、シート状に押し出し、冷却装置により冷却して、無延伸シートを得た。そして、このシートを140℃の温度にまで再度加熱した後、縦方向に5倍延伸した。

【0040】(2)MFRが4.0g/10分のポリブ

ロピレン81重量%に高密度ポリエチレン3重量%及び平均粒径1.5μmの炭酸カルシウム16重量%とを混合した表面層用組成物(B)と、MFRが4g/10分のポリプロピレン54重量%と平均粒径1.5μmの炭酸カルシウム46重量%を混合した裏面層用組成物

(C)とを、別の押出機にて熔融混練させた後、これをダイよりシート状に熔融押し出し、これを(1)の5倍延伸フィルムの両面に積層し、三層構造の積層フィルムを得た。次いで、この三層構造の積層フィルムを60℃まで冷却した後、再び約160℃の温度にまで加熱して、テンターを用いて横方向に7.5倍延伸し、165℃の温度でアニーリング処理して、60℃の温度にまで冷却し、耳部をスリットして三層構造(一軸延伸/二軸延伸/一軸延伸)の、肉厚80μm(B/A/C=16μm/48μm/16μm)、空孔率15%の合成紙を得た。なお、各層の空孔率は、(B/A/C=3%/29.7%/30%)であった。

#### 【0041】例 2

(1)メルトフローレート(MFR)が0.8g/10分のポリプロピレン(融点約164~167℃)81重量%に、高密度ポリエチレン3重量%及び平均粒径1.5μmの炭酸カルシウム16重量%を混合した組成物(A)を270℃に設定した押出機にて混練した後、シート状に押し出し、冷却装置により冷却して、無延伸シートを得た。そして、このシートを150℃の温度にまで再度加熱した後、縦方向に5倍延伸した。

【0042】(2)MFRが4g/10分のポリプロピレン(融点約164~167℃)54重量%と、平均粒径1.5μmの炭酸カルシウム46重量%を混合した組成物(B)を別の押出機にて混練させた後、これをダイよりシート状に押し出し、これを(1)の5倍延伸フィルムの両面に積層し、三層構造の積層フィルムを得た。次いで、この三層構造の積層フィルムを60℃まで冷却した後、再び約175℃の温度にまで加熱して、テンターを用いて横方向に7.5倍延伸し、165℃の温度でアニーリング処理して、60℃の温度にまで冷却し、耳部をスリットして三層構造(一軸延伸/二軸延伸/一軸延伸)の、肉厚80μm(B/A/B=20μm/40μm/20μm)、空孔率15%の合成紙を得た。なお、各層の空孔率は、(B/A/B=4.6%/13.9%/4.6%)であった。これら合成紙(微多孔性フィルム)の物性を表1に示す。

#### 【0043】

##### 【表1】



合 成 紙	肉 厚 ( $\mu\text{m}$ )	密 度 ( $\text{g}/\text{cm}^3$ )	不透明度 (%)	空孔率 (%)	粗 さ ( $\mu\text{m}$ )				平滑度 (秒)	表面強度 $\text{kg} \cdot \text{cm}$
					最大高さ ( $\text{SR}_{\text{max}}$ )	中心面 平均粗さ ( $\text{SR}_{\text{a}}$ )	中心面 山高さ ( $\text{SR}_{\text{p}}$ )	中心面 谷深さ ( $\text{SR}_{\text{v}}$ )		
例 1	80	0.830	88	15	7.9	0.31	5.5	2.2	840	3.5
例 2	80	0.851	88	9.3	5.4	0.30	3.1	2.0	900	1.9

【0044】これら合成紙の表面(B)に、三菱油化(株)製の帯電防止性プライマー“サフトマー1300”を2 $\mu\text{m}$ の厚みに塗布し、このプライマーの上に商品名、製造元名、図柄等を、東洋いんき製造(株)のUVオフセットインク“FDO-G”(商品名)を用いて印刷した。

#### 【0045】押出発泡フィルム(a)の製造例

##### 例 3

三菱油化(株)製のプロピレン・エチレンブロック共重合体(MFR; 0.5g/10分「三菱ポリプロEC9」:商品名)100重量部に、化学発泡剤としてクエン酸モノナトリウムと炭酸水素ナトリウムの1:1の混合物3.5重量部を配合して、発泡性樹脂組成物とし、口径65mmの押出機で熔融混練し、次いでT-ダイより大気圧中に押出して発泡させ、ロールで冷却して肉厚0.5mm、発泡倍率1.5倍、独立気泡率81%の発泡フィルムを得た。

#### 【0046】例 4

線状低密度エチレン重合体(MFR; 0.7g/10分「三菱ポリエチUE320」:商品名)100重量部に、化学発泡剤としてアゾジカルボナミド2重量部を配合して発泡性樹脂組成物とし、口径65mmの押出機で熔融混練した。一方、三菱油化(株)製のプロピレン・エチレンブロック共重合体(MFR; 1.8g/10分「三菱ポリプロEC8」:商品名)30重量%。前記線状低密度エチレン重合体50重量%及び充填剤としてタルク20重量%を配合して、口径90mmの押出機で熔融混練した。ついで、これらを一台の共押出ダイに供給し、共押出して発泡させ、非発泡層の肉厚が100 $\mu\text{m}$ 、発泡層の肉厚が800 $\mu\text{m}$ の二層構造フィルムを得た。発泡層の発泡倍率は1.8倍、独立気泡率は88%であった。

#### 【0047】感熱性粘着剤の調製

##### 例 5

フタル酸ジシクロヘキシル316重量部、濃度30重量%のスチレン・無水マレイン酸・アクリル酸n-ブチル共重合体溶液53重量部、濃度50重量%のアビエチン酸ロジンエステルエマルジョン158重量部、濃度50重量%のエチレン・酢酸ビニル共重合体184重量部、濃度が20重量%のコロイダルシリカ160重量部および水120重量部を混合して白色不透明の水性感熱性粘着剤を調製した。

#### 【0048】例 6

フタル酸ジシクロヘキシル40重量部、濃度50重量%のアビエチン酸ロジンエステルエマルジョン30重量部、濃度が50重量%のエチレン・酢酸ビニル共重合体水性エマルジョン22重量部および濃度が20重量%のポリビニルアルコール15重量部を混合して水性感熱性粘着剤を調製した。

【0049】(実施例1)例1で得た合成紙の印刷面とは反対の表面に、ポリエーテル・ポリオールとポリイソシアネートの混合プライマーを1g/ $\text{m}^2$ の割合で塗布し、これに例4で得た押出発泡フィルムを貼着して肉厚581 $\mu\text{m}$ の積層体を得た。この積層体の発泡体層側に例5で得た感熱性粘着剤を固型分で13g/ $\text{m}^2$ となる量塗布し、40℃で2分乾燥して感熱性粘着剤層を設けた。これを23℃、55%相対湿度の恒温室に2日間保管した。ついで、合成紙の表面に商品図柄、商品名、製造元、成分表示、単価等を多色グラビア印刷し、幅40mmにスリットし、ロール巻きしてディレード・ラベルのロール状物を得た。

【0050】これらロール状物を、(i)23℃、相対湿度55%の恒温室および(ii)40℃、相対湿度75%の恒温室に7日間保存した。ついで、これらのディレード・ラベルのロール状物を光洋自動機(株)のロールラベラーLR-401KR(商品名)を用い、被着材(ガラス瓶、ブリキ缶)上に、加熱機構の温度120℃、被着材へのディレード・ラベルの押圧1kgの条件でラベリングした。各被着材への接着力(1日経過後)は、次の表2の通りであった。

【0051】また、ラベリングされた被着材上のラベルの印刷の部分剥離の有無を次の四段階で評価した。

0——印刷の剥離はまったくない。

1——40 $\text{cm}^2$  当り、1~3個の小さな白抜けがあるが、実用上全く問題がない。

2——40 $\text{cm}^2$  当り、4~10個の小さな白抜けがある。

3——印刷部分の皮むけがところどころあり、実用上製品価値がない。

【0052】更に、ラベリング時のディレード・ラベルの巻き戻し易さ(抗ブロッキング性)を次の五段階で評価した。

5——剥離抵抗ない。

4——剥離時に若干音がするときがあるが、実用上問題ない。

50 3——剥離時に連続的に音がする。

2——ブロッキングによる印刷部分の皮むけが見受けられる。

1——ロールの巻き戻しができない。

結果を表 2 に示す。ガラス瓶に酒 180 ml を入れ、これを 90℃ の湯内に 15 分間入れ、お燗し、ラベルの剥

離の有無、ラベルの熱収縮による変形の有無を調べた。また、この瓶を手でもったときの熱さが身体的苦痛を与えるか否かを調べた。結果を表 2 にしめす。

【0053】

【表 2】

		被着材への接着強度 (gf/40mm幅)		印刷剥離 程 度	抗ブロッキン グ性の程度	ラベルの 剥離の有無	ラベルの熱収縮 による変形の有無	手への熱さの 伝わり具合
		ガラス瓶	ステンレス缶					
保 管 条 件	(i)	2,210	2,370	0	5	な し	な し	苦痛でない
	(ii)	2,180	2,280	0	5	な し	な し	苦痛でない

【0054】（実施例 2）合成紙として、例 1 の合成紙の代りに例 2 のものを、発泡体層として大阪印刷インキ製造（株）製の発泡インキ“オレフィン用発泡インキ”（商品名）を噴射して肉厚 0.3mm に形成したものを用いる他は同様にしてディレード・ラベルを製造し、ラベリングを行った。ラベルの評価結果を表 3 に示す。

【0055】（実施例 3）実施例 1 において、水性感熱性粘着剤として例 6 で得たものを固型分量で 14 g/m<sup>2</sup> となるように塗布し、100℃ で乾燥する他は同様にしてディレード・ラベルを得、これをスリットしてロール状に巻いた。これを 20℃、相対湿度 55% の恒温室で 1 日保管後、ラベリングマシンに挿着し、加熱機構 100℃ でブリキ缶に貼着させた。抗ブロッキング性は良好（評価 5）で、印刷の剥離もなかった。ステンレス缶との接着強度は、初期 1,600 gf/40mm 幅、3 日経過後 2,420 gf/40mm 幅であった。ラベルの評価結果を表 3 に示す。

【0056】実施例 1 において、発泡体層として例 3 のものの代わりに例 4 の押出發泡フィルムを用いる他は同様にしてディレード・ラベルを得た。ラベルの評価結果を表 3 に示す。

【0057】

【表 3】



	合成紙 の種類	発泡体層	感熱性 粘着剤層	保管条件 (i)		保管条件 (ii)		75%RH 抗ブロッキング性	瓶をした酒瓶の 手での把持性
				印刷剥離の程度**	抗ブロッキング性**	印刷剥離の程度	抗ブロッキング性		
実施例 1	例 1	例 3	例 5	0	5	0	5		苦痛を感じない
実施例 2	例 2	発泡イソ	例 5	0	4	1	4		苦痛を感じない
実施例 3	例 1	例 3	例 6	0	5	0	5		苦痛を感じない
実施例 4	例 1	例 4	例 5	0	5	0	5		苦痛を感じない

\*2 数値が小さい方が優れる。

\*3 数値が大きい方が優れる。

【0058】

【発明の効果】本発明のディレード・ラベルは高温・多湿時においてもブロッキングが少なく、ロール状ラベルの巻き戻し時の印刷の剥離がなく、断熱性に富んだ感熱性粘着型ラベルである。

【図面の簡単な説明】

【図1】ラベルマシンの平面図である。

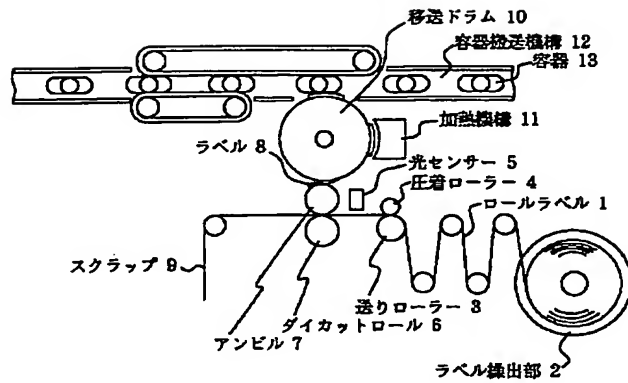
【図2】シートの表面強度を測定する装置の一部を示す平面図である。

10 【図3】本発明のディレード・ラベルの断面図である。

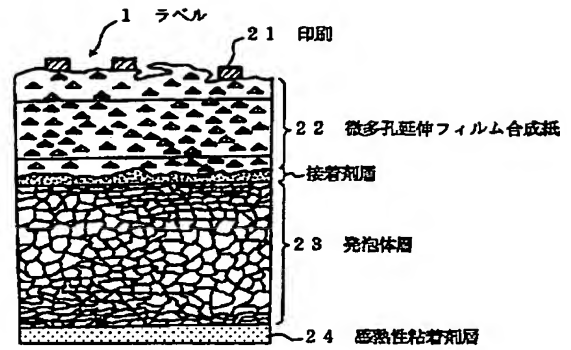
【符号の説明】

- 1 ロールラベル
- 2 ラベル繰出部
- 3 送りローラー
- 4 圧着ローラー
- 5 光センサー
- 6 ダイカットローラー
- 7 アンビル
- 8 ラベル
- 20 9 スクラップ
- 10 移送ドラム
- 11 加熱機構
- 12 容器搬送機構
- 13 容器
- 20 スケール
- 21 印刷
- 22 合成紙
- 23 発泡体層
- 24 感熱性粘着剤層

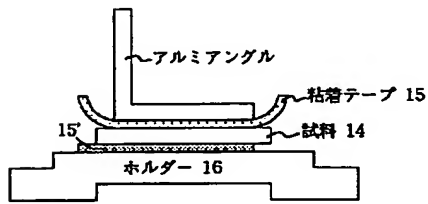
【図 1】



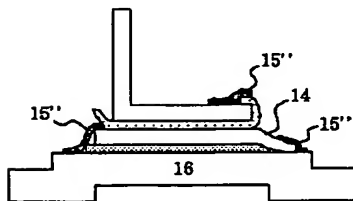
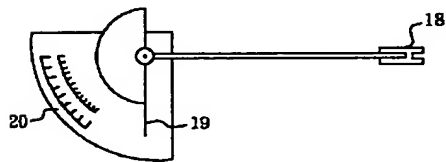
【図 3】



【図 2】



2a



2b

フロントページの続き

(51) Int. Cl.<sup>4</sup>

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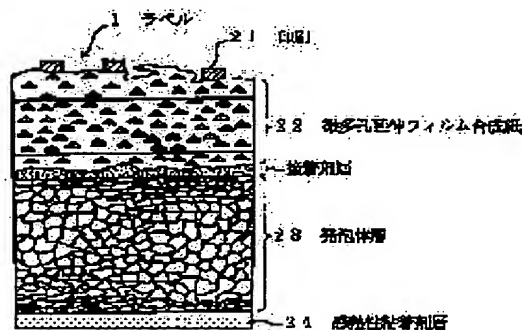
(72)Inventor : YASUDA JUNICHI

## (54) DELAYED LABEL

## (57)Abstract:

**PURPOSE:** To obtain a label which requires no control of temp. and humidity during storage and to prevent heat shrink of the label even when heating temp. is high, by laminating a foamed layer on the back surface of a porous synthetic paper comprising a stretched thermoplastic resin film and further forming a thermosensitive adhesive layer on the back surface of the foamed layer.

**CONSTITUTION:** A foamed layer 23 is laminated on the back surface of a porous synthetic paper 22 comprising a stretched thermoplastic resin film which contains an inorg. fine powder and has a print 21 on its surface. Further, a thermosensitive adhesive layer 24 is formed on the back surface of the foamed layer 23. By this method, the surface of the label to be printed is controlled to have enough smoothness and surface roughness to prevent blocking but not to decrease printing property. Moreover, the base sheet used has enough surface strength that the print does not peel by the adhesive force of the thermosensitive adhesive layer 24 when the delayed label in a rolled state curls back. Thereby, although the label contains an inorg. powder to improve printing property, no trouble concerning to paper dust is caused.



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CLAIMS

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## [Claim(s)]

[Claim 1] The DIREDO label which the laminating of the foam layer was carried out to the rear face of the fine porosity synthetic paper with which printing becomes a front face from the drawing object of the thermoplastics film which contains the end of \*\*\*\* non-subtlety fine powder in \*\*\*\*, and prepared the thermosensitive binder layer in the rear face of the foam layer further.

[Claim 2] The DIREDO label this surface layer (B) of whose to which the void content which uses as a substratum (A) the fine porosity film with which a synthetic paper consists of a biaxially oriented film of a propylene system resin film, and is used as the surface layer (B) of fine porosity which mean particle diameter becomes from the uniaxial stretched film of the propylene system resin film which contains the end of non-subtlety fine powder which is 0.05-3 micrometers eight to 55% of the weight is the laminated film which is 5 - 35%, printing be performed is what satisfies the conditions of \*\* of a degree - \*\*.

\*\* JIS The longitudinal-plane-of-symmetry average of roughness height (SRa) measured by B0601 is the granularity 3.0-8.5 micrometers and whose longitudinal-plane-of-symmetry trough depth (SRv) 0.20-0.38 micrometers and longitudinal-plane-of-symmetry crest height (SRp) are 2.0-4.0 micrometers.

\*\* JIS The surface smoothness (Beck characteristic) measured by P8119 is 400 - 1,200 seconds.

\*\* The surface reinforcement of a lengthwise direction is 1 - 10 kg-cm.

[Claim 3] The DIREDO label according to claim 1 whose foam layer 0.5-3mm and expansion ratio is [ thickness ] the extrusion-foaming film of 65% or more of thermoplastics, or a foaming ink layer whose thickness is 0.1-2mm for 1.1 to 5 times, and the rate of a closed cell.

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## DETAILED DESCRIPTION

## [Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the DIREDO label (a tuck seal is also included) used for heating and carrying out welding to containers, such as a container which holds contents, such as hot liquids, such as a sake can, a sake bottle, a coffee can, and \*\*\*\*.

[0002]

[Description of the Prior Art] The pressure-sensitive arrival label which formed the pressure-sensitive binder in the rear face of the base material sheet with which patterns and alphabetic characters, such as goods, a trade name, the manufacturer, and a price, were printed by the front face, and covered this binder front face with the release paper further is well-known. Although this pressure-sensitive arrival label is convenient to keep it, in case this is stuck on a container, when it is necessary to remove a release paper from a label and, and an effort is applied to disposal of that release paper and this pressure-sensitive arrival label is made into a roll volume, only the thick part of a release paper is rolled and the diameter of a roll becomes large.

[0003] The thermosensitive binder in which adhesiveness is not shown in ordinary temperature (10-30 degrees C) is applied to the rear face of a base material sheet as what improved this fault, and the DIREDO label (thermosensitive pressure sensitive adhesive label) which printed to the reverse side is proposed and put in practical use (refer to JP,5-18433,B, JP,1-222290,A, a 4-72125 official report, a 5-32241 official report, a 6-27881 official report, a 6-100847 official report, and a 6-100848 official report). As a base material sheet, pulp paper-milling paper, rayon paper-milling paper, pigment coated paper, and a synthetic paper are illustrated.

[0004] The thermosensitive binder of this DIREDO label does not show adhesiveness in ordinary temperature, but it is heated and adhesiveness is activated. This DIREDO label is pasted together by the container using the labelling machine shown in drawing 1. The DIREDO label (1) by which the roll volume was carried out should specifically be caught with a delivery roller (3) and a sticking-by-pressure roller (4) from the label delivery section (2). Let out by the revolution of these rollers (3) and (4), and the location of a DIREDO label is checked by the photosensor (5). A label is cut into a label dimension between Annville (7) which has a die cut roll (6) and an attraction hole, and the cut label (8) is attracted by Annville (7), and is sent in the direction of a migration drum (10). (9) is the scrap from which the label was clipped.

[0005] A migration drum (10) moves a label (8) from Annville (7), and is heated by 80-100 degrees C according to a heating device (11), the thermosensitive binder of a label (8) is tintured with activity, and a label is made to stick on the drum section of the container (13) sent according to the container conveyance device (12). The adhesive strength at the time of these DIREDO label not showing adhesiveness in ordinary temperature, but a thermosensitive adhesive layer activating it with heating, and making adherends, such as a container, a metal plate, textile fabrics, and a glass plate, stick therefore is high. A roll volume is carried out, it is kept, in case a labeler machine is used and this is stuck on an adherend, there is no blocking, rewinding is easy and it is required that printing of a DIREDO label should not exfoliate by this thermosensitive binder layer.

[0006] therefore — the season when the atmospheric temperature in June - September may exceed 30 degrees C in order that the DIREDO label by which the roll volume was carried out may prevent this blocking — the chamber temperature of a place for safekeeping — the temperature of 10-20 degrees C — and humidity is adjusted and kept to 35 - 60%. It is because blocking will arise, and a part of printing will separate at the time of rewinding and the adhesive strength to a base material will be influenced by humidity, if chamber temperature serves as 35-50 degrees C and an elevated temperature. Control of humidity is required especially when hygroscopic like pulp paper-milling paper and rayon fiber paper-milling paper in a base material sheet.

[0007] The pattern of goods, the manufacturer, the handling method, etc. are printed by the container front face of the metal can which, on the other hand, contained the glass bottle of the sake used for \*\*, a steel can, an aluminium can, the coffee heated by 85-90 degrees C, tea, and rice gruel. It has the can and bottle of this hot drink by hand, and among the purchasers who are going to drink, since a certain person senses heat for a hand, he is covering, holding and drinking the can and the bottle in the handkerchief.

[0008]

[Problem(s) to be Solved by the Invention] The adjustment of temperature and humidity of this invention is unnecessary at the time of storage of a roll volume DIREDO label. And in order to do high-speed the attachment activity to the DIREDO label of an adherend, even if it makes whenever [stoving temperature] into a 100-125-degree C elevated temperature, a label does not produce a heat shrink. And if a purchaser holds the part of this label by hand when this DIREDO label is stuck on a can or a bottle, it will aim at offer of the DIREDO label which does not sense heat.

[0009]

[Means for Solving the Problem] The laminating of the foam layer is carried out to the rear face of the fine porosity synthetic paper which consists of a drawing object of the thermoplastics film containing the end of non-subtlety fine powder printing was performed to the front face, and this invention offers the DIREDO label which prepared the thermosensitive binder layer in the rear face of the foam layer further.

[0010]

[Function] Since the base material sheet which has surface reinforcement about which the surface condition that a label is printed is adjusted to smoothness and surface roughness by which blocking is prevented, without spoiling printing nature, and printing does not exfoliate in the adhesion of the thermosensitive adhesive layer at the time of rewinding [of a roll-like DIREDO label] was used, even if it is a label containing the non-subtlety fine-powder end for the improvement in printing, a paper-powder trouble does not arise. Moreover, since it has adiathermic by existence of a foam layer, this DIREDO label is not sensed hot as the detailed micro void of a synthetic paper, although the hot drink can and bottle by which this label was stuck are held by hand.

[0011] (Outline of invention)

As a fine porosity synthetic paper which consists of a thermoplastics film drawing object containing the end of non-subtlety fine powder printing is performed to a synthetic paper front face, the thing of (b) shown below or (b) is mentioned, for example.

(\*\*) — the biaxially oriented films (JP,54-31032,B, a U.S. Pat. No. 3775521 description, a U.S. Pat. No. 3758661 description, a U.S. Pat. No. 3844865 description, U.S. Pat. No. 4303708 description, etc.) of the thermoplastics which has the fine porosity which contains the end of non-subtlety fine powder at 8 - 45% of the weight of a rate.

[0012] (\*\*) — the synthetic paper (reference, such as JP,46-40794,B, JP,57-149363,A, and JP,57-181829,A) which uses as a base material layer (1a) the 2 \*\*\*\* propylene system resin film which contains the end of non-subtlety fine powder five to 80% of the weight, and is used as the uniaxial stretched film paper-like layer (1b) of the propylene system resin which contains the end of non-subtlety fine powder eight to 65% of the weight.

[0013] Even if this synthetic paper is three layer systems (JP,46-40794,B) in which a base material layer and the paper-like layer of the uniaxial stretched film on the rear face of a table exist even if it is two-layer structure the synthetic paper (JP,50-29738,B —) of three layers — seven layers with which other resin film layers exist between a paper-like layer and a base material layer. Even if it is JP,57-149363,A, JP,56-126155,A, and JP,57-181829,A a rear face — the metal salt (Na —) of an ethylene methyl-acrylate copolymer, and an ethylene and (meta) an acrylic-acid copolymer. You may be the synthetic paper of three or more layers which has the heat-sealing layer which consists of base material layer resin, such as Li, Zn, K, and chlorinated polyethylene, from the resin of a low-melt point point (JP,3-13973,B).

[0014] Moreover, in order to raise offset-printing nature further on the front face of this synthetic paper, the spreading layer which improves the water-soluble printing nature chosen from the group which consists of polyethyleneimine, Pori (ethyleneimine-urea), the ethylene imide addition product of a polyamine polyamide, the epichlorohydrin addition product of a polyamine polyamide, the third class, or the fourth class nitrogen content acrylic resin may be prepared.

[0015] An example of the synthetic paper of three layer systems the thermoplastics film which contains the end of non-subtlety fine powder five to 40% of the weight. To both sides of the film which carried out orientation to 1 shaft orientations extended and acquired at temperature lower than the melting point of this resin in an one direction. The laminating of the melting film of the thermoplastics which contains the end of non-subtlety fine powder eight to 65% of the weight is carried out. Subsequently, it is the film which the paper-like layer obtained by extending this laminated film in said direction and direction of a right angle carries out orientation to 1 shaft orientations, and has many detailed openings, and a base material layer is the laminating structure which carried out orientation to 2 shaft orientations. Of course, the layer of said primer (paint) may be prepared in this front face, offset-printing nature may be raised more, and the base material layer (1a) of a biaxially oriented film contributes to the length of a synthetic paper, and grant of horizontal balance on the strength, and the uniaxial stretched film (1b, 1c) of a paper-like layer presents paper-aesthetic property.

[0016] The fine porosity film which consists of a biaxially oriented film of the propylene system resin film contained eight to 40% of the weight after non-subtlety fine powder also in these synthetic papers is used as a base material layer (A). It is the laminated film whose void content used as the surface layer (B) which mean particle diameter becomes from the uniaxial-stretching object of the propylene system resin film which contains the end of non-subtlety fine powder which is 0.05-3 micrometers zero to 55% of the weight is 5 - 35%. The synthetic paper this whose surface layer (B) to which printing is performed is what satisfies the conditions of \*\* of a degree — \*\* is desirable from the field of thermal resistance, profitability, waterproofness, and anti-blocking nature.

[0017] \*\* JIS The longitudinal-plane-of-symmetry average of roughness height (SRa) measured by B0601 is the granularity 3.0-8.5 micrometers and whose longitudinal-plane-of-symmetry trough depth (SRv) 0.20-0.38 micrometers and longitudinal-plane-of-symmetry crest height (SRp) are 2.0-4.0 micrometers.

\*\* JIS The surface smoothness (Beck characteristic) measured by P8119 is 400 - 1,200 seconds.

\*\* The surface reinforcement of a lengthwise direction is 1 - 10 kg-cm.

[0018] Although the high density polyethylene whose melting point is 120 degrees C or more, propylene system resin, polyethylene terephthalate, a polyamide, a polycarbonate, etc. are mentioned as thermoplastics, high density polyethylene and propylene system resin are desirable from the field of profitability. As this propylene system resin, a propylene homopolymer, a propylene ethylene copolymer, a propylene butene-1 copolymer, a propylene ethylene butene-1 copolymer, a propylene and 4-methyl pentene -1 copolymer, a propylene and 3-methyl pentene -1 copolymer, etc. are mentioned. A copolymer may be a random copolymer or may be a block copolymer.

[0019] In order to make ductility good at these propylenes system resin, resin with the melting point lower than polypropylene, such as polyethylene, polystyrene, and an ethylene-vinylacetate copolymer, may be blended three to 25% of the weight. Moreover, as the end of non-subtlety fine powder, that whose particle size, such as a calcium carbonate, baking clay, a silica, a silicious marl, talc, titanium oxide, and a barium sulfate, is 0.03-3 micrometers is used. The content in the non-subtlety fine powder end of a substratum (A) is 15 - 33 % of the weight preferably eight to 40% of the weight, and the content of a surface layer (B) is 8 - 30 % of the weight preferably zero to 55% of the weight. When there are few contents in the non-subtlety fine powder end of a surface layer, thickness of a surface layer (B) is set to 0.5-3 micrometers, and irregularity is imprinted for the configuration of the irregularity of the front face of the substratum (A) which serves as a split face under the effect of the end of non-subtlety fine powder which exists in a substratum (A) on the surface of a surface layer (B).

[0020] Four to 10 times of draw magnification are [ length and a longitudinal direction ] desirable, and drawing temperature is temperature lower 3-30 degrees C than the melting point of thermoplastics. This synthetic paper is a drawing thermoplastics film which has many detailed voids inside a film. A label has adiabatic by existence of this void and existence of a foam layer, and a heat shrink is not produced even if a DIREDO label is heated by the heating device (11) of a labelling machine. In addition, the amount of the detailed void of a synthetic paper is 5 - 25% preferably 5 to 35% in the void content computed by the degree type.

[0021]

[Formula 1]

$$\text{空孔率 (\%)} = \frac{\rho_0 - \rho}{\rho_0} \times 100$$

$\rho_0$  : 延伸前のフィルムの密度

$\rho$  : 延伸後のフィルムの密度

[0022] This base material sheet may be the laminated film of three layer systems with which the surface layer (B) was prepared in both sides of a substratum (A), and other resin layers may exist between a substratum (A) and a surface layer (B).

Furthermore, in order to make offset-printing nature good, or in order to give antistatic nature to a label, the water-soluble

primer chosen from the group which consists of polyethyleneimine, Pori (ethyleneimine-urea), the ethyleneimine addition product of a polyamine polyamide, the epichlorohydrin addition product of a polyamine polyamide, the third class, or the fourth class nitrogen content acrylic resin may be applied to a surface layer.

[0023] The thickness of a primer is 0.2–5 micrometers. Moreover, the thickness of 30–120 micrometers and a surface layer (B) of the thickness of a substratum (A) is 0.5–50 micrometers, and 50–150 micrometers of thickness of a base material sheet are 60–120 micrometers preferably. Surface roughness \*\* of the surface layer (B) of a base material sheet is a display parameter in a micro visual field, and surface smoothness \*\* (a value with the larger number of seconds is more excellent in smooth nature) is a display parameter in a macro-visual field.

[0024] Since the blocking prevention effectiveness in case the longitudinal-plane-of-symmetry average of roughness height (SRa) rewinds the DIREDO label in which less than 3.0 micrometers and the Beck characteristic carried out [ less than 0.20 micrometers and longitudinal-plane-of-symmetry crest height (SRa) ] the roll volume in 1,200 seconds or more is small, it is necessary to keep a roll volume label at the temperature of 20 degrees C or less, and there is no merit conventionally as usual as compared with elegance.

[0025] Or SRp to which SRa exceeds 0.38 micrometers exceeds 8.5 micrometers, the prevention effectiveness of a paper powder trouble (omission from the base material sheet after non-subtlety fine powder) does not have the enough Beck characteristic in less than 400 seconds, and a white omission can see in printing at the time of roll volume DIREDO label rewinding. The longitudinal-plane-of-symmetry trough depth (SRv) will serve as a numeric value between 0.20–4.0 micrometers generally, if the value of the above-mentioned longitudinal-plane-of-symmetry height (SRp), and the longitudinal-plane-of-symmetry average of roughness height (SRa) and the Beck characteristic becomes settled.

[0026] Since printing may exfoliate from a base material sheet according to the adhesion of a thermosensitive adhesive layer at the time of rewinding [ of the DIREDO label with which surface reinforcement was low with the label and the roll volume was carried out ] if there are many contents in the non-subtlety fine powder end of a surface layer (B), or when a surface layer is a biaxially oriented film, a lengthwise direction and a longitudinal direction are the surface reinforcement of a surface layer (B) 1kg/cm<sup>2</sup> It is made to become the above. It depends for surface reinforcement on the class of resin, the class after non-subtlety fine powder, mean particle diameter, particle size distribution, a content, drawing temperature, draw magnification, etc. Moreover, it is influenced by the conditions of the calender cliff which compresses a front face with the roll after base material sheet manufacture, and makes a base material sheet front face smoothness more.

[0027] The internal bond tester of Kumagaya Riki Kogyo K.K. is used for this surface reinforcement. Sample (14) (length of a base material sheet in the center on the rear face of a table of 25.4mm and horizontal 45mm) the Sumitomo 3M adhesive tape with a width of face of 18mm — “a Scotch whisky clear tape (15)” (trade name) — What was pasted up without 15mm of one end pasting up (15') is made into a sample. This is fixed on the electrode holder 16 of \*\* internal bond tester, as shown in drawing 2 ( drawing 2 a). After fixing this with another adhesive tape (15'') and carrying an aluminum angle type (17) on it, on an aluminum angle type (17), adhesive tape (15) is fixed with bending and still more nearly another adhesive tape (15''), as shown in drawing 2 b, and a 1kg load is applied to a sample for 1 minute. \*\* It is the value which subsequently read the value of the energy which the needle (19) at the time of carrying out the pendulum (18) which attached the weight after adjusting a zero location under [ of 90 degrees ] for the first time in [ \*\*\*\*\* ] by pushing a push button ( drawing 2 b), adding an impact to an aluminum angle type, and making a part of sample (15) exfoliate with an aluminum angle type showed with the scale (20).

[0028] In case this surface reinforcement makes an adherend stick a DIREDO label using a labelling machine in less than 1 kg-cm, a part of printing part serves as a hide, and the phenomenon for hides of separating from a label happens. It is difficult to consider as 10 or more kg-cm, in view of the raw material of a surface layer.

[0029] The foaming latex layer in which thickness is used for the backing of the foaming ink layer the extrusion-foaming film of 65% or more of thermoplastics or whose thickness 0.5 to 5 times and the rate of a closed cell is 0.1–2mm, and a carpet, for example as a foam layer by which a laminating is carried out to the rear face of a foam layer synthetic paper is mentioned. The melting point or softening temperatures, such as polyethylene, polypropylene, polystyrene, an ethylene-vinylacetate copolymer, high impact polystyrene, a polyvinyl chloride, and ABS, do with an extruder melting and kneading of the thermoplastics constituent to which the end of non-subtlety fine powder was contained according to a chemistry foaming agent or a physical foaming agent, and the need in thermoplastics 180 degrees C or less (peak temperature of DSC), and the above-mentioned extrusion-foaming film is \*\*. From a T die or a circular die, extrusion foaming is carried out to the shape of a film, and this is cooled and manufactured.

[0030] As a foaming agent, there are a chemistry foaming agent and a physical foaming agent, and such mixture, such as an azo JIKARUN amide, azobisisobutyronitril, diazoaminobenzene, N, N'-dinitrosopentamethylenetetramine, N, N'-dimethyl-N, N'-dinitro terephthalamide, benzenesulphonyl hydrazide, GCC acid hydrogen sodium salt, and citric-acid monosodium salt, can be mentioned as a former chemistry foaming agent. These are used at 0.1 – 3% of the weight of a rate to resin. Moreover, as a latter physical foaming agent, these for which hydrocarbons, such as butane, a propane, and a pentane, are used are used at 15 – 40% of the weight of a rate to a resinous principle.

[0031] Generally as the end of non-subtlety fine powder, particle size can mention preferably a 0.5–10-micrometer calcium carbonate, a magnesium carbonate, a calcium hydroxide, a magnesium hydroxide, an aluminum hydroxide, aluminum phosphate, talc, a mica, clay, carbon black, graphite, a zeolite, a barium sulfate, a water calcium silicate, diatomaceous earth, titanium oxide, an aluminum sulfate, 0.05–30 micrometers of silicas etc., etc. It is used at 55 or less % of the weight of a rate to a resinous principle the end of non-subtlety fine powder. In addition, to an extrusion-foaming film molding resin constituent, additives other than the above-mentioned compounding agent, such as a slipping agent of an antioxidant, a coloring agent, an ultraviolet ray absorbent, an antistatic agent, a dispersant, a nucleating additive, a plasticizer and a fatty-acid metal salt, and a fatty-acid amide, may be added if needed.

[0032] 0.5–3mm, if it is difficult with the technique of the present [ manufacture / are 0.5–2mm preferably and / a less than 0.5mm extrusion-foaming film ] and the thickness of an extrusion-foaming film (a) is too thin, adiabatic efficiency is scarce, and when holding a hot drink [ like green tea, tea, and coffee ] whose inside of a container is, as for the thickness of the extrusion-foaming film (a) which constitutes a foam layer, a container cannot be held by hand. Furthermore, if thickness exceeds 3mm, the cost of a label becomes high too much.

[0033] If expansion ratio is low, the rate of elastic recovery of a label will serve as smallness, the expansion ratio of a foaming extruded film is 1.5 to 3 times as many \*\* as this preferably 1.1 to 5 times, the adhesive strength of a label, and a hollow container and a metal vessel becomes low, and supply of a label will become difficult if expansion ratio is too high conversely. This extrusion-foaming film usually requires that a closed cell should be 65% or more, in order to be called the foam of a closed



cell. By being a rate of a closed cell, the rate of elastic recovery of a label and rigidity are high, and supply of a label becomes easy.

[0034] As a foaming ink layer, they are coating or the thing injected and obtained about the fizz ink which consists of the raw material for foaming (a carbon generation ingredient and foaming agent), a color pigment, and a vehicle. As a carbon generation raw material, hydrocarbons, such as starch, a dextrin, and sugar, Monod, Resin, such as polyhydric alcohol, such as G, the Tori-pentaerythritol, and a glycerol, a urea-resin, melamine resin, polyurethane, and an epoxy resin, as a foaming agent Carbon dioxide gas, Freon, ammonium phosphate, ammonium polyphosphate, a dicyandiamide, a urea, a melamine, guanidine, chloroparaffin, etc. as a color pigment Titanium oxide, \*\*\*\*, umber, iron black, etc. as a vehicle Aquosity emulsions, such as polyvinyl acetate, acrylic-acid alkyl, ester system resin, and a styrene acrylic-acid alkyl ester copolymer, What dissolved alkyd resin, a polyvinyl chloride, urethane resin, an epoxy resin, etc. in solvents, such as a methyl ethyl ketone and toluene, is used.

[0035] The form backing used for the backing agent of a carpet can also be used as a formation agent of a foam layer. This thing into the mixture of an SBR latex and natural rubber latex A frothing agent like an oleic acid potassium, A foam stabilizer like the TORIMEN base, an accelerator like mercaptobenzothiazole zinc salt or diethyldithiocarbamic acid zinc salt, clay, an aluminum hydroxide, and A agent containing a bulking agent like a calcium carbonate, It consists of a C agent containing a gelling agent [ like ]. B agent containing vulcanizing agents, such as a zinc white and sulfur, and ammonium acetate concentration — After making what added B agent stir and foam to A agent with a foaming machine and adding C agent to this further, a foam layer with a thickness of 1-5mm which applies on the rear face of a synthetic paper and consists of independent detailed air bubbles is made to form.

[0036] As a thermosensitive binder layer thermosensitive binder layer is shown in the above-mentioned official report group (a) Polyvinyl acetate, polymethacrylic acid n-butyl, a vinyl ether-vinylidene-chloride copolymer, Natural rubber, a vinyl acetate-2-ethylhexyl acrylate copolymer, a vinyl acetate-ethylene copolymer, Glass transition points, such as a vinyl-pyrrolidone-styrene copolymer, styrene-butadiene rubber, a butyl-rubber, and a vinyl-pyrrolidone-ethyl-acrylate copolymer, macromolecule resin 20 degrees C or less, (b) Diphenyl phthalate, phthalic-acid dihexyl, dicyclohexyl phthalate, Phthalic-acid BIHIDORO loon ethyl, isophthalic acid dimethyl, benzoic-acid SUKUROZU, 2 benzoic-acid ethylene glycol, 3 benzoic-acid trimethylolethane, In ordinary temperature, such as a 3 benzoic-acid glyceride, 4 benzoic-acid pentaerythritol, sucrose-octoacetate, citric-acid tricyclohexyl, and N-cyclohexyl-p-trien sulfonamide, a solid plasticizer, (c) — a rosin derivative (rosin, polymerization rosin, hydrogenation rosin, and those glycerols —) Terpene resin systems, such as ester with pentaerythritol etc., and a resin acid dimer, Tackifiers, such as a petroleum resin system, a phenol resin system, and a xylene resin system, are not contained, and in ordinary temperature (10-25 degrees C), adhesiveness is not shown, but heating (80-130 degrees C) shows activity, and even if it stops heating, adhesiveness is shown for a while (5 seconds - two weeks).

[0037] As occasion demands, an antioxidant, colloidal silica, alumina sol, etc. may be blended. Although the coverage of the thermosensitive binder applied to a base material sheet is based on the construction material of an adherend, and the thickness of a base material sheet, it is the range of 8 - 30 g/m<sup>2</sup> (solid daily dose).

[0038] The pattern of a trade name, the component of goods, a unit price, the manufacturer, and goods etc. is performed on the front face of a printing synthetic paper by gravure, screen-stencil, offset printing, flexographic printing, etc. Although it is general to be carried out after a thermosensitive binder layer is prepared in the rear face of a label as for printing, printing may be formed in a label and a foam layer and a thermosensitive adhesive layer may be made to form in a rear face after \*\*\*\*\*,

[0039]

[Example] An example explains this invention to a detail further below.

Example of the example of manufacture of a synthetic paper After kneading the constituent for substrata (A) which mixed 3 % of the weight of high density polyethylene, and 16 % of the weight of calcium carbonates with a mean particle diameter of 1.5 micrometers with the extruder set as 270 degrees C in 1 (1) melt-flow-rate (MFR) 0.8g / 81 % of the weight of polypropylene for 10 minutes, in it, it extruded in the shape of a sheet, it cooled with the cooling system in it, and the non-extended sheet was obtained in it. And after heating this sheet again even in temperature of 140 degrees C, it extended 5 times to the lengthwise direction.

[0040] (2) The constituent for surface layers with which MFR mixed 3 % of the weight of high density polyethylene, and 16 % of the weight of calcium carbonates with a mean particle diameter of 1.5 micrometers in 81 % of the weight of polypropylene for 4.0g / 10 minutes (B), The constituent for rear-face layers (C) with which MFR mixed 46 % of the weight of calcium carbonates with a mean particle diameter of 1.5 micrometers with 54 % of the weight of polypropylene for 4g / 10 minutes After carrying out melting kneading with another extruder, this was made into the shape of a sheet from the die, the laminating of melting extrusion and this was made to both sides of a 5 time oriented film of (1), and the laminated film of three layer systems was obtained. Subsequently, after cooling the laminated film of these three layer systems to 60 degrees C, it heats even in temperature of about 160 degrees C again. Extend 7.5 times in a longitudinal direction using a tenter, and annealing processing is carried out at the temperature of 165 degrees C. It cooled even in temperature of 60 degrees C, the slit of the handle part was carried out, and the synthetic paper of the thickness of 80 micrometers (B/A/C=16micrometer / 48 micrometers / 16 micrometers) of three layer systems (uniaxial stretching / biaxial stretching / uniaxial stretching) and 15% of void contents was obtained. In addition, the void contents of each class were (B/A/C=3% / 29.7% / 30%).

[0041] Example After 2 (1) melt flow rates (MFR) kneaded the constituent (A) which mixed 3 % of the weight of high density polyethylene, and 16 % of the weight of calcium carbonates with a mean particle diameter of 1.5 micrometers with the extruder set as 270 degrees C in 81 % of the weight (melting point of about 164-167 degrees C) of polypropylene for 0.8g / 10 minutes, in it, they extruded in the shape of a sheet, cooled with the cooling system in it, and obtained the non-extended sheet in it. And after heating this sheet again even in temperature of 150 degrees C, it extended 5 times to the lengthwise direction.

[0042] (2) After MFR made the constituent (B) which mixed 46 % of the weight of calcium carbonates with a mean particle diameter of 1.5 micrometers with 54 % of the weight (melting point of about 164-167 degrees C) of polypropylene for 4g / 10 minutes knead with another extruder, this was extruded in the shape of a sheet from the die, the laminating of this was carried out to both sides of a 5 time oriented film of (1), and the laminated film of three layer systems was obtained. Subsequently, after cooling the laminated film of these three layer systems to 60 degrees C, it heats even in temperature of about 175 degrees C again. Extend 7.5 times in a longitudinal direction using a tenter, and annealing processing is carried out at the temperature of 165 degrees C. It cooled even in temperature of 60 degrees C, the slit of the handle part was carried out, and the synthetic paper of the thickness of 80 micrometers (B/A/B=20micrometer / 40 micrometers / 20 micrometers) of three layer systems (uniaxial stretching / biaxial stretching / uniaxial stretching) and 15% of void contents was obtained. In addition, the void contents of each class were (B/A/B=4.6% / 13.9% / 4.6%). The physical properties of these synthetic papers (fine porosity film) are shown in a

table 1.  
[0043]  
[A table 1]

合 成 紙	肉 厚 ( $\mu\text{m}$ )	密 度 ( $\text{g}/\text{cm}^3$ )	不透明度 (%)	空孔率 (%)	粗 さ ( $\mu\text{m}$ )				平滑度 (秒)	表面強度 $\text{kg} \cdot \text{cm}$
					最大高さ (SRmax)	中心面 平均粗さ (SRa)	中心面 山高さ (SRp)	中心面 谷深さ (SRv)		
例 1	80	0.830	88	15	7.9	0.31	5.5	2.2	840	3.5
例 2	80	0.851	88	9.3	5.4	0.30	3.1	2.0	900	1.9

[0044] On the front face (B) of these synthetic papers, the antistatic nature primer "SAFUTOMA 1300" by Mitsubishi Petrochemical Co., Ltd. was applied to the thickness of 2 micrometers, on this primer, UV offset ink "FDO-G" (trade name) of Oriental \*\*\*\*\* Manufacture was used, and the trade name, the manufacturer name, the pattern, etc. were printed.

[0045] Example of the example of manufacture of an extrusion-foaming film (a) In the propylene ethylene block-copolymer (MFR:0.5g / 10 minutes "Mitsubishi polypropylene EC 9": trade name) 100 weight section by 3 Mitsubishi Petrochemical Co., Ltd. The mixture 3.5 weight section of 1:1 of a citric-acid monosodium and a sodium hydrogencarbonate is blended as a chemistry foaming agent. It considered as the fizz resin constituent and melting kneading was carried out with the extruder with an aperture of 65mm, subsequently to the inside of atmospheric pressure, from T-die, it was made to extrude and foam, it cooled with a roll, and the foaming film of one 1.5 times the expansion ratio [ the thickness of 0.5mm and ] of this and 81% of rates of a closed cell was obtained.

[0046] example 4 — a line — a low consistency ethylene polymer (MFR:0.7g / 10 minutes "Mitsubishi polyethylene UE320": trade name) (the AZOJKARUBONAMIDO 2 weight section was blended with the 100 weight sections as a chemistry foaming agent, it considered as the fizz resin constituent, and melting kneading was carried out with the extruder with an aperture of 65mm.) On the other hand, it is 30 % of the weight (MFR:1.8g / 10 minutes "Mitsubishi polypropylene EC 8": trade name) of propylene ethylene block copolymers by Mitsubishi Petrochemical Co., Ltd. said line — 20 % of the weight of talc was blended as 50 % of the weight of low consistency ethylene polymers, and a bulking agent, and melting kneading was carried out with the extruder with an aperture of 90mm. Subsequently, these were made to co-extrude [ they supplied them and ] and foam to one set of a co-extrusion die, and the thickness of a non-foaming layer obtained the two-layer structure film whose thickness of 100 micrometers and a foaming layer is 800 micrometers. It was 1.8 times the expansion ratio of a foaming layer of this, and the rate of a closed cell was 88%.

[0047] Example of preparation of a thermosensitive binder The 5 dicyclohexyl-phthalate 316 weight section, the styrene, maleic-anhydride, and acrylic-acid n-butyl copolymer solution 53 weight section of 30 % of the weight of concentration, the abietic-acid rosin ester emulsion 158 weight section of 50 % of the weight of concentration, the ethylene-vinylacetate copolymer 184 weight section of 50 % of the weight of concentration, the colloidal silica 160 weight section whose concentration is 20 % of the weight, and the water 120 weight section were mixed, and the opaque white aqueosity thermosensitive binder was prepared.

[0048] Example The polyvinyl alcohol 15 weight section whose ethylene-vinylacetate copolymer aqueosity emulsion 22 weight section and concentration the 6 dicyclohexyl-phthalate 40 weight section, the abietic-acid rosin ester emulsion 30 weight section of 50 % of the weight of concentration, and whose concentration are 50 % of the weight are 20 % of the weight was mixed, and the aqueosity thermosensitive binder was prepared.

[0049] (Example 1) To a reverse front face, the printing side of the synthetic paper obtained in Example 1 is the mixed primer of polyether polyol and the poly isocyanate 1 g/m<sup>2</sup> It applied at a rate, the extrusion-foaming film obtained in Example 4 to this was stuck, and the layered product with a thickness of 581 micrometers was obtained. It is the thermosensitive binder obtained in Example 5 to the foam layer side of this layered product at a part for solid 13 g/m<sup>2</sup> It became, and amount spreading was carried out, it dried at 40 degrees C for 2 minutes, and the thermosensitive binder layer was prepared. This was kept for two days to 23 degrees C and the thermostatic chamber of 55% relative humidity. Subsequently, multicolor gravure of a goods pattern, a trade name, the manufacturer, an ingredients label, the unit price, etc. was carried out on the surface of the synthetic paper, the slit was carried out to width of face of 40mm, the roll volume was carried out to it, and the roll-like object of a DIREDO label was obtained.

[0050] The these rolls-like object was saved for seven days in (i)23 degree C, the thermostatic chamber of 55% of relative humidity and (ii)40 degree C, and the thermostatic chamber of 75% of relative humidity. Subsequently, labeling of the roll-like object of these DIREDO labels was carried out on the adherend (a carboy, tin plate can) using roll labeler LR-401KR (trade name) of Mitsuhiro Automatic Machine on the conditions of 1kg of press of the temperature of 120 degrees C of a heating device, and the DIREDO label to an adherend. The adhesive strength (after [ one day ] progress) to each adherend was as in the following table 2.

[0051] Moreover, the existence of the partial avulsion of printing of the label on the adherend by which labeling was carried out was evaluated in the following four steps.

There is no exfoliation of 0 — printing.

It is 2 1—40cm. Although it hits and there are 1-3 small white omissions, it is completely satisfactory practically.

It is 2 2—40cm. It hits and there are 4-10 small white omissions.

There are those of 3 — printing part for hides in some places, and there is no product value practically.

[0052] Furthermore, it evaluated the rewinding easy (anti-blocking nature) of the DIREDO label at the time of labeling in the following five steps.

There is no 5 — exfoliation resistance.

Although there may be a sound a little at the time of 4 — exfoliation, it is satisfactory practically.

There is continuous a sound at the time of 3 — exfoliation.

Those of the printing part by 2 — blocking for hides can see.

It cannot perform rewinding [ of 1 — roll ].

A result is shown in a table 2. 180ml of alcohol was put into the carboy, this was put in for 15 minutes in the 90-degree C molten

bath, I \*\* (ed), and the existence of exfoliation of a label and the existence of deformation by the heat shrink of a label were investigated. Moreover, it investigated whether the heat when having this bottle by hand would give physical pain. A result is shown in a table 2.

[0053]

[A table 2]

		被着材への接着強度 (gf / 40 mm幅)		印刷剥離 程 度	抗ブロッキン グ性の程度	ラベルの 剥離の有無	ラベルの熱収縮 による変形の有無	手への熱さの 伝わり具合
		ガラス瓶	ステンレス缶					
保 管 条 件	(i)	2. 2 1 0	2. 3 7 0	0	5	な し	な し	苦痛でない
	(ii)	2. 1 8 0	2. 2 8 0	0	5	な し	な し	苦痛でない

[0054] (Example 2) What injected the thing of Example 2 instead of the synthetic paper of Example 1 as a synthetic paper, injected the foaming ink made from Osaka Printing ink Manufacture "the foaming ink for olefins" (trade name) as a foam layer, and was formed in the thickness of 0.3mm was used, and also the DIREDO label was manufactured similarly, and labeling was performed. The assessment result of a label is shown in a table 3.

[0055] (Example 3) It is what was obtained in Example 6 as an aqueous thermosensitive binder in the example 1 with a solid daily dose 14 g/m<sup>2</sup> It applied so that it might become, and it dried at 100 degrees C, and also the DIREDO label was obtained similarly, the slit of this was carried out, and it wound in the shape of a roll. This was inserted in the labelling machine after storage in 20 degrees C and the thermostatic chamber of 55% of relative humidity on the 1st, and the tin plate can was made to stick at 100 degrees C of heating devices. Anti-blocking nature is fitness (assessment 5), and did not have exfoliation of printing, either. The bond strength with a stainless steel can was initial 1,600gf / 40mm width of face, and three-day after [ progress ] 2,420gf / 40mm width of face. The assessment result of a label is shown in a table 3.

[0056] In the example 1, the extrusion-foaming film of Example 4 was used instead of the thing of Example 3 as a foam layer, and also the DIREDO label was obtained similarly. The assessment result of a label is shown in a table 3.

[0057]

[A table 3]

	合成紙 の種類	発泡体層	感熱性 粘着利層	保管条件 (i)		保管条件 (ii)		40℃, 75%RH 抗ブロッキング性	燭をした酒瓶の 手での把持性
				印刷剥離の程度*2	抗ブロッキング性*3	印刷剥離の程度	抗ブロッキング性		
実施例 1	例 1	例 3	例 5	0	5	0	5	5	苦痛を感じない
実施例 2	例 2	発泡ソク	例 5	0	4	1	4	4	苦痛を感じない
実施例 3	例 1	例 3	例 6	0	5	0	5	5	苦痛を感じない
実施例 4	例 1	例 4	例 5	0	5	0	5	5	苦痛を感じない

\*2 数値が小さい方が優れる。

\*3 数値が大きい方が優れる。

[0058]

[Effect of the Invention] The DIREDO label of this invention is a thermosensitive adhesion mold label which there is little blocking at the time of an elevated temperature and humid, and there is no exfoliation of printing at the time of rewinding [ of a roll-like label ] in it, and was rich in adiathermic.

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**TECHNICAL FIELD**

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[Industrial Application] This invention relates to the DIREDO label (a tuck seal is also included) used for heating and carrying out welding to containers, such as a container which holds contents, such as hot liquids, such as a sake can, a sake bottle, a coffee can, and \*\*\*.

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PRIOR ART

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[Description of the Prior Art] The pressure-sensitive arrival label which formed the pressure-sensitive binder in the rear face of the base material sheet with which patterns and alphabetic characters, such as goods, a trade name, the manufacturer, and a price, were printed by the front face, and covered this binder front face with the release paper further is well-known. Although this pressure-sensitive arrival label is convenient to keep it, in case this is stuck on a container, when it is necessary to remove a release paper from a label and, and an effort is applied to disposal of that release paper and this pressure-sensitive arrival label is made into a roll volume, only the thick part of a release paper is rolled and the diameter of a roll becomes large.

[0003] The thermosensitive binder in which adhesiveness is not shown in ordinary temperature (10-30 degrees C) is applied to the rear face of a base material sheet as what improved this fault, and the DIREDO label (thermosensitive pressure sensitive adhesive label) which printed to the reverse side is proposed and put in practical use (refer to JP,5-18433,B, JP,1-222290,A, a 4-72125 official report, a 5-32241 official report, a 6-27881 official report, a 6-100847 official report, and a 6-100848 official report). As a base material sheet, pulp paper-milling paper, rayon paper-milling paper, pigment coated paper, and a synthetic paper are illustrated.

[0004] The thermosensitive binder of this DIREDO label does not show adhesiveness in ordinary temperature, but it is heated and adhesiveness is activated. This DIREDO label is pasted together by the container using the labelling machine shown in drawing 1. The DIREDO label (1) by which the roll volume was carried out should specifically be caught with a delivery roller (3) and a sticking-by-pressure roller (4) from the label delivery section (2). Let out by the revolution of these rollers (3) and (4), and the location of a DIREDO label is checked by the photosensor (5). A label is cut into a label dimension between Annville (7) which has a die cut roll (6) and an attraction hole, and the cut label (8) is attracted by Annville (7), and is sent in the direction of a migration drum (10). (9) is the scrap from which the label was clipped.

[0005] A migration drum (10) moves a label (8) from Annville (7), and is heated by 80-100 degrees C according to a heating device (11), the thermosensitive binder of a label (8) is tintured with activity, and a label is made to stick on the drum section of the container (13) sent according to the container conveyance device (12). The adhesive strength at the time of these DIREDO label not showing adhesiveness in ordinary temperature, but a thermosensitive adhesive layer activating it with heating, and making adherends, such as a container, a metal plate, textile fabrics, and a glass plate, stick therefore is high. A roll volume is carried out, it is kept, in case a labeler machine is used and this is stuck on an adherend, there is no blocking, rewinding is easy and it is required that printing of a DIREDO label should not exfoliate by this thermosensitive binder layer.

[0006] therefore — the season when the atmospheric temperature in June - September may exceed 30 degrees C in order that the DIREDO label by which the roll volume was carried out may prevent this blocking — the chamber temperature of a place for safekeeping — the temperature of 10-20 degrees C — and humidity is adjusted and kept to 35 - 60%. It is because blocking will arise, and a part of printing will separate at the time of rewinding and the adhesive strength to a base material will be influenced by humidity, if chamber temperature serves as 35-50 degrees C and an elevated temperature. Control of humidity is required especially when hygroscopic like pulp paper-milling paper and rayon fiber paper-milling paper in a base material sheet.

[0007] The pattern of goods, the manufacturer, the handling method, etc. are printed by the container front face of the metal can which, on the other hand, contained the glass bottle of the sake used for \*\*, a steel can, an aluminium can, the coffee heated by 85-90 degrees C, tea, and rice gruel. It has the can and bottle of this hot drink by hand, and among the purchasers who are going to drink, since a certain person senses heat for a hand, he is covering, holding and drinking the can and the bottle in the handkerchief.

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EFFECT OF THE INVENTION

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[Effect of the Invention] The DIREDO label of this invention is a thermosensitive adhesion mold label which there is little blocking at the time of an elevated temperature and humid, and there is no exfoliation of printing at the time of rewinding [ of a roll-like label ] in it, and was rich in adiathermic.

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TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] The adjustment of temperature and humidity of this invention is unnecessary at the time of storage of a roll volume DIREDO label. And in order to do high-speed the attachment activity to the DIREDO label of an adherend, even if it makes whenever [ stoving temperature ] into a 100-125-degree C elevated temperature, a label does not produce a heat shrink. And if a purchaser holds the part of this label by hand when this DIREDO label is stuck on a can or a bottle, it will aim at offer of the DIREDO label which does not sense heat.

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**MEANS**

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[Means for Solving the Problem] The laminating of the foam layer is carried out to the rear face of the fine porosity synthetic paper which consists of a drawing object of the thermoplastics film containing the end of non-subtlety fine powder printing was performed to the front face, and this invention offers the DIREDO label which prepared the thermosensitive binder layer in the rear face of the foam layer further.

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## OPERATION

[Function] Since the base material sheet which has surface reinforcement about which the surface condition that a label is printed is adjusted to smoothness and surface roughness by which blocking is prevented, without spoiling printing nature, and printing does not exfoliate in the adhesion of the thermosensitive adhesive layer at the time of rewinding [ of a roll-like DIREDO label ] was used, even if it is a label containing the non-subtlety fine-powder end for the improvement in printing, a paper-powder trouble does not arise. Moreover, since it has adiathermic by existence of a foam layer, this DIREDO label is not sensed hot as the detailed micro void of a synthetic paper, although the hot drink can and bottle by which this label was stuck are held by hand.

## [0011] (Outline of invention)

As a fine porosity synthetic paper which consists of a thermoplastics film drawing object containing the end of non-subtlety fine powder printing is performed to a synthetic paper front face, the thing of (b) shown below or (b) is mentioned, for example.

(\*\*) — the biaxially oriented films (JP,54-31032,B, a U.S. Pat. No. 3775521 description, a U.S. Pat. No. 3758661 description, a U.S. Pat. No. 3844865 description, U.S. Pat. No. 4303708 description, etc.) of the thermoplastics which has the fine porosity which contains the end of non-subtlety fine powder at 8 - 45% of the weight of a rate.

[0012] (\*\*) — the synthetic paper (reference, such as JP,46-40794,B, JP,57-149363,A, and JP,57-181829,A) which uses as a base material layer (1a) the 2 \*\*\*\* propylene system resin film which contains the end of non-subtlety fine powder five to 80% of the weight, and is used as the uniaxial stretched film paper-like layer (1b) of the propylene system resin which contains the end of non-subtlety fine powder eight to 65% of the weight.

[0013] Even if this synthetic paper is three layer systems (JP,46-40794,B) in which a base material layer and the paper-like layer of the uniaxial stretched film on the rear face of a table exist even if it is two-layer structure the synthetic paper (JP,50-29738,B —) of three layers - seven layers with which other resin film layers exist between a paper-like layer and a base material layer Even if it is JP,57-149363,A, JP,56-126155,A, and JP,57-181829,A a rear face — the metal salt (Na —) of an ethylene methyl-acrylate copolymer, and an ethylene and (meta) an acrylic-acid copolymer You may be the synthetic paper of three or more layers which has the heat-sealing layer which consists of base material layer resin, such as Li, Zn, K, and chlorinated polyethylene, from the resin of a low-melt point point (JP,3-13973,B).

[0014] Moreover, in order to raise offset-printing nature further on the front face of this synthetic paper, the spreading layer which improves the water-soluble printing nature chosen from the group which consists of polyethyleneimine, Pori (ethyleneimine-urea), the ethylene imide addition product of a polyamine polyamide, the epichlorohydrin addition product of a polyamine polyamide, the third class, or the fourth class nitrogen content acrylic resin may be prepared.

[0015] An example of the synthetic paper of three layer systems the thermoplastics film which contains the end of non-subtlety fine powder five to 40% of the weight To both sides of the film which carried out orientation to 1 shaft orientations extended and acquired at temperature lower than the melting point of this resin in an one direction The laminating of the melting film of the thermoplastics which contains the end of non-subtlety fine powder eight to 65% of the weight is carried out. Subsequently, it is the film which the paper-like layer obtained by extending this laminated film in said direction and direction of a right angle carries out orientation to 1 shaft orientations, and has many detailed openings, and a base material layer is the laminating structure which carried out orientation to 2 shaft orientations. Of course, the layer of said primer (paint) may be prepared in this front face, offset-printing nature may be raised more, and the base material layer (1a) of a biaxially oriented film contributes to the length of a synthetic paper, and grant of horizontal balance on the strength, and the uniaxial stretched film (1b, 1c) of a paper-like layer presents paper-aesthetic property.

[0016] The fine porosity film which consists of a biaxially oriented film of the propylene system resin film contained eight to 40% of the weight after non-subtlety fine powder also in these synthetic papers is used as a base material layer (A). It is the laminated film whose void content used as the surface layer (B) which mean particle diameter becomes from the uniaxial-stretching object of the propylene system resin film which contains the end of non-subtlety fine powder which is 0.05-3 micrometers zero to 55% of the weight is 5 - 35%. The synthetic paper this whose surface layer (B) to which printing is performed is what satisfies the conditions of \*\* of a degree - \*\* is desirable from the field of thermal resistance, profitability, waterproofness, and anti-blocking nature.

[0017] \*\* JIS The longitudinal-plane-of-symmetry average of roughness height (SRa) measured by B0601 is the granularity 3.0-8.5 micrometers and whose longitudinal-plane-of-symmetry trough depth (SRv) 0.20-0.38 micrometers and longitudinal-plane-of-symmetry crest height (SRp) are 2.0-4.0 micrometers.

\*\* JIS The surface smoothness (Beck characteristic) measured by P8119 is 400 - 1,200 seconds.

\*\* The surface reinforcement of a lengthwise direction is 1 - 10 kg-cm.

[0018] Although the high density polyethylene whose melting point is 120 degrees C or more, propylene system resin, polyethylene terephthalate, a polyamide, a polycarbonate, etc. are mentioned as thermoplastics, high density polyethylene and propylene system resin are desirable from the field of profitability. As this propylene system resin, a propylene homopolymer, a propylene ethylene copolymer, a propylene butene-1 copolymer, a propylene ethylene butene-1 copolymer, a propylene and 4-methyl pentene -1 copolymer, a propylene and 3-methyl pentene -1 copolymer, etc. are mentioned. A copolymer may be a random copolymer or may be a block copolymer.

[0019] In order to make ductility good at these propylenes system resin, resin with the melting point lower than polypropylene, such as polyethylene, polystyrene, and an ethylene-vinylacetate copolymer, may be blended three to 25% of the weight. Moreover, as the end of non-subtlety fine powder, that whose particle size, such as a calcium carbonate, baking clay, a silica, a silicious marl, talc, titanium oxide, and a barium sulfate, is 0.03-3 micrometers is used. The content in the non-subtlety fine powder end of a substratum (A) is 15 - 33 % of the weight preferably eight to 40% of the weight, and the content of a surface layer (B) is 8 - 30 % of the weight preferably zero to 55% of the weight. When there are few contents in the non-subtlety fine powder end of a surface layer, thickness of a surface layer (B) is set to 0.5-3 micrometers, and irregularity is imprinted for the configuration of the irregularity of the front face of the substratum (A) which serves as a split face under the effect of the end of non-subtlety fine powder which exists in a substratum (A) on the surface of a surface layer (B).

[0020] Four to 10 times of draw magnification are [ length and a longitudinal direction ] desirable, and drawing temperature is temperature lower 3-30 degrees C than the melting point of thermoplastics. This synthetic paper is a drawing thermoplastics film which has many detailed voids inside a film. A label has adiathermic by existence of this void and existence of a foam layer, and a

heat shrink is not produced even if a DIREDO label is heated by the heating device (11) of a labelling machine. In addition, the amount of the detailed void of a synthetic paper is 5 - 25% preferably 5 to 35% in the void content computed by the degree type. [0021]

[Formula 1]

$$\text{空孔率 (\%)} = \frac{\rho_0 - \rho}{\rho_0} \times 100$$

$\rho_0$  : 延伸前のフィルム密度

$\rho$  : 延伸後のフィルム密度

[0022] This base material sheet may be the laminated film of three layer systems with which the surface layer (B) was prepared in both sides of a substratum (A), and other resin layers may exist between a substratum (A) and a surface layer (B).

Furthermore, in order to make offset-printing nature good, or in order to give antistatic nature to a label, the water-soluble primer chosen from the group which consists of polyethyleneimine, Pori (ethyleneimine-urea), the ethyleneimine addition product of a polyamine polyamide, the epichlorohydrin addition product of a polyamine polyamide, the third class, or the fourth class nitrogen content acrylic resin may be applied to a surface layer.

[0023] The thickness of a primer is 0.2-5 micrometers. Moreover, the thickness of 30-120 micrometers and a surface layer (B) of the thickness of a substratum (A) is 0.5-50 micrometers, and 50-150 micrometers of thickness of a base material sheet are 60-120 micrometers preferably. Surface roughness \*\* of the surface layer (B) of a base material sheet is a display parameter in a micro-visual field, and surface smoothness \*\* (a value with the larger number of seconds is more excellent in smooth nature) is a display parameter in a macro-visual field.

[0024] Since the blocking prevention effectiveness in case the longitudinal-plane-of-symmetry average of roughness height (SRa) rewinds the DIREDO label in which less than 3.0 micrometers and the Beck characteristic carried out [ less than 0.20 micrometers and longitudinal-plane-of-symmetry crest height (SRa) ] the roll volume in 1,200 seconds or more is small, it is necessary to keep a roll volume label at the temperature of 20 degrees C or less, and there is no merit conventionally as usual as compared with elegance.

[0025] Or SRp to which SRa exceeds 0.38 micrometers exceeds 8.5 micrometers, the prevention effectiveness of a paper powder trouble (omission from the base material sheet after non-subtlety fine powder) does not have the enough Beck characteristic in less than 400 seconds, and a white omission can see in printing at the time of roll volume DIREDO label rewinding. The longitudinal-plane-of-symmetry trough depth (SRv) will serve as a numeric value between 0.20-4.0 micrometers generally, if the value of the above-mentioned longitudinal-plane-of-symmetry height (SRp), and the longitudinal-plane-of-symmetry average of roughness height (SRa) and the Beck characteristic becomes settled.

[0026] Since printing may exfoliate from a base material sheet according to the adhesion of a thermosensitive adhesive layer at the time of rewinding [ of the DIREDO label with which surface reinforcement was low with the label and the roll volume was carried out ] if there are many contents in the non-subtlety fine powder end of a surface layer (B), or when a surface layer is a biaxially oriented film, a lengthwise direction and a longitudinal direction are the surface reinforcement of a surface layer (B) 1kg/cm<sup>2</sup> It is made to become the above. It depends for surface reinforcement on the class of resin, the class after non-subtlety fine powder, mean particle diameter, particle size distribution, a content, drawing temperature, draw magnification, etc. Moreover, it is influenced by the conditions of the calender cliff which compresses a front face with the roll after base material sheet manufacture, and makes a base material sheet front face smoothness more.

[0027] The internal bond tester of Kumagaya Riki Kogyo K.K. is used for this surface reinforcement. Sample (14) (length of a base material sheet in the center on the rear face of a table of 25.4mm and horizontal 45mm) the Sumitomo 3M adhesive tape with a width of face of 18mm — "a Scotch whisky clear tape (15)" (trade name) — What was pasted up without 15mm of one end pasting up (15') is made into a sample. This is fixed on the electrode holder 16 of \*\* internal bond tester, as shown in drawing 2 ( drawing 2 a ). After fixing this with another adhesive tape (15'') and carrying an aluminum angle type (17) on it, on an aluminum angle type (17), adhesive tape (15) is fixed with bending and still more nearly another adhesive tape (15''), as shown in drawing 2 b, and a 1kg load is applied to a sample for 1 minute. \*\* It is the value which subsequently read the value of the energy which the needle (19) at the time of carrying out the pendulum (18) which attached the weight after adjusting a zero location under [ of 90 degrees ] for the first time in [ \*\*\*\*\* ] by pushing a push button ( drawing 2 b ), adding an impact to an aluminum angle type, and making a part of sample (15) exfoliate with an aluminum angle type showed with the scale (20).

[0028] In case this surface reinforcement makes an adherend stick a DIREDO label using a labelling machine in under 1kg and cm, a part of printing part serves as a hide, and the phenomenon for hides of separating from a label happens. It is difficult to consider as 10 or more kg-cm, in view of the raw material of a surface layer.

[0029] The foaming latex layer in which thickness is used for the backing of the foaming ink layer the extrusion-foaming film of 65% or more of thermoplastics or whose thickness 0.5 to 5 times and the rate of a closed cell is 0.1-2mm, and a carpet, for example as a foam layer by which a laminating is carried out to the rear face of a foam layer synthetic paper is mentioned. The melting point or softening temperatures, such as polyethylene, polypropylene, polystyrene, an ethylene-vinylacetate copolymer, high impact polystyrene, a polyvinyl chloride, and ABS, do with an extruder melting and kneading of the thermoplastics constituent to which the end of non-subtlety fine powder was contained according to a chemistry foaming agent or a physical foaming agent, and the need in thermoplastics 180 degrees C or less (peak temperature of DSC), and the above-mentioned extrusion-foaming film is \*\*. From a T die or a circular die, extrusion foaming is carried out to the shape of a film, and this is cooled and manufactured.

[0030] As a foaming agent, there are a chemistry foaming agent and a physical foaming agent, and such mixture, such as an azo JIKARUN amide, azobisisobutyronitril, diazoaminobenzene, N, N'-dinitrosopentamethylenetetramine, N, N'-dimethyl-N, N'-dinitro terephthalamide, benzenesulphonyl hydrazide, GCC acid hydrogen sodium salt, and citric-acid monosodium salt, can be mentioned as a former chemistry foaming agent. These are used at 0.1 - 3% of the weight of a rate to resin. Moreover, as a latter physical foaming agent, these for which hydrocarbons, such as butane, a propane, and a pentane, are used are used at 15 - 40% of the weight of a rate to a resinous principle.

[0031] Generally as the end of non-subtlety fine powder, particle size can mention preferably a 0.5-10-micrometer calcium carbonate, a magnesium carbonate, a calcium hydroxide, a magnesium hydroxide, an aluminum hydroxide, aluminum phosphate, talc, a mica, clay, carbon black, graphite, a zeolite, a barium sulfate, a water calcium silicate, diatomaceous earth, titanium oxide, an aluminum sulfate, 0.05-30 micrometers of silicas etc., etc. It is used at 55 or less % of the weight of a rate to a resinous principle the end of non-subtlety fine powder. In addition, to an extrusion-foaming film molding resin constituent, additives other than the above-mentioned compounding agent, such as a slipping agent of an antioxidant, a coloring agent, an ultraviolet ray absorbent, an antistatic agent, a dispersant, a nucleating additive, a plasticizer and a fatty-acid metal salt, and a fatty-acid amide, may be added if needed.

[0032] 0.5-3mm, if it is difficult with the technique of the present [ manufacture / are 0.5-2mm preferably and / a less than 0.5mm extrusion-foaming film ] and the thickness of an extrusion-foaming film (a) is too thin, adiabatic efficiency is scarce, and when holding a hot drink [ like green tea, tea, and coffee ] whose inside of a container is, as for the thickness of the extrusion-foaming film (a) which constitutes a foam layer, a container cannot be held by hand. Furthermore, if thickness exceeds 3mm, the cost of a label becomes high too much.

[0033] If expansion ratio is low, the rate of elastic recovery of a label will serve as smallness, the expansion ratio of a foaming extruded film is 1.5 to 3 times as many \*\* as this preferably 1.1 to 5 times, the adhesive strength of a label, and a hollow container and a metal vessel becomes low, and supply of a label will become difficult if expansion ratio is too high conversely. This extrusion-foaming film usually requires that a closed cell should be 65% or more, in order to be called the foam of a closed cell. By being a rate of a closed cell, the rate of elastic recovery of a label and rigidity are high, and supply of a label becomes easy.

[0034] As a foaming ink layer, they are coating or the thing injected and obtained about the fizz ink which consists of the raw material for foaming (a carbon generation ingredient and foaming agent), a color pigment, and a vehicle. As a carbon generation raw material, hydrocarbons, such as starch, a dextrin, and sugar, Monod, Resin, such as polyhydric alcohol, such as G, the Tori-pentaerythritol, and a glycerol, a urea-resin, melamine resin, polyurethane, and an epoxy resin, as a foaming agent Carbon dioxide gas, Freon, ammonium phosphate, ammonium polyphosphate, a dicyandiamide, a urea, a melamine, guanidine, chloroparaffin, etc. as a color pigment Titanium oxide, \*\*\*\*, umber, iron black, etc. as a vehicle Aquosity emulsions, such as polyvinyl acetate, acrylic-acid alkyl, ester system resin, and a styrene acrylic-acid alkyl ester copolymer, What dissolved alkyd resin, a polyvinyl chloride, urethane resin, an epoxy resin, etc. in solvents, such as a methyl ethyl ketone and toluene, is used.

[0035] The form backing used for the backing agent of a carpet can also be used as a formation agent of a foam layer. This thing into the mixture of an SBR latex and natural rubber latex A frothing agent like an oleic acid potassium, A foam stabilizer like the TORIMEN base, an accelerator like mercaptobenzothiazole zinc salt or diethyldithiocarbamic acid zinc salt, clay, an aluminum hydroxide, and A agent containing a bulking agent like a calcium carbonate, It consists of a C agent containing a gelling agent [ like ]. B agent containing vulcanizing agents, such as a zinc white and sulfur, and ammonium acetate concentration — After making what added B agent stir and foam to A agent with a foaming machine and adding C agent to this further, a foam layer with a thickness of 1-5mm which applies on the rear face of a synthetic paper and consists of independent detailed air bubbles is made to form.

[0036] As a thermosensitive binder layer thermosensitive binder layer is shown in the above-mentioned official report group (a) Polyvinyl acetate, polymethacrylic acid n-butyl, a vinyl ether-vinylidene-chloride copolymer, Natural rubber, a vinyl acetate-2-ethylhexyl acrylate copolymer, a vinyl acetate-ethylene copolymer, Glass transition points, such as a vinyl-pyrrolidone-styrene copolymer, styrene-butadiene rubber, a butyl rubber, and a vinyl-pyrrolidone-ethyl-acrylate copolymer, macromolecule resin 20 degrees C or less, (b) Diphenyl phthalate, phthalic-acid dihexyl, dicyclohexyl phthalate, Phthalic-acid BIHIDORO loon ethyl, isophthalic acid dimethyl, benzoic-acid SUKUROZU, 2 benzoic-acid ethylene glycol, 3 benzoic-acid trimethylolethane, In ordinary temperature, such as a 3 benzoic-acid glyceride, 4 benzoic-acid pentaerythritol, sucrose-octoacetate, citric-acid tricyclohexyl, and N-cyclohexyl-p-trien sulfonamide, a solid plasticizer, (c) — a rosin derivative (rosin, polymerization rosin, hydrogenation rosin, and those glycerols —) Terpene resin systems, such as ester with pentaerythritol etc., and a resin acid dimer, Tackifiers, such as a petroleum resin system, a phenol resin system, and a xylene resin system, are not contained, and in ordinary temperature (10-25 degrees C), adhesiveness is not shown, but heating (80-130 degrees C) shows activity, and even if it stops heating, adhesiveness is shown for a while (5 seconds - two weeks).

[0037] As occasion demands, an antioxidant, colloidal silica, alumina sol, etc. may be blended. Although the coverage of the thermosensitive binder applied to a base material sheet is based on the construction material of an adherend, and the thickness of a base material sheet, it is the range of 8 - 30 g/m2 (solid daily dose).

[0038] The pattern of a trade name, the component of goods, a unit price, the manufacturer, and goods etc. is performed on the front face of a printing synthetic paper by gravure, screen-stencil, offset printing, flexographic printing, etc. Although it is general to be carried out after a thermosensitive binder layer is prepared in the rear face of a label as for printing, printing may be formed in a label and a foam layer and a thermosensitive adhesive layer may be made to form in a rear face after \*\*\*\*\*.

## EXAMPLE

[Example] An example explains this invention to a detail further below.

Example of the example of manufacture of a synthetic paper After kneading the constituent for substrata (A) which mixed 3 % of the weight of high density polyethylene, and 16 % of the weight of calcium carbonates with a mean particle diameter of 1.5 micrometers with the extruder set as 270 degrees C in 1 (1) melt-flow-rate (MFR) 0.8g / 81 % of the weight of polypropylene for 10 minutes, in it, it extruded in the shape of a sheet, it cooled with the cooling system in it, and the non-extended sheet was obtained in it. And after heating this sheet again even in temperature of 140 degrees C, it extended 5 times to the lengthwise direction.

[0040] (2) The constituent for surface layers with which MFR mixed 3 % of the weight of high density polyethylene, and 16 % of the weight of calcium carbonates with a mean particle diameter of 1.5 micrometers in 81 % of the weight of polypropylene for 4.0g / 10 minutes (B). The constituent for rear-face layers (C) with which MFR mixed 46 % of the weight of calcium carbonates with a mean particle diameter of 1.5 micrometers with 54 % of the weight of polypropylene for 4g / 10 minutes After carrying out melting kneading with another extruder, this was made into the shape of a sheet from the die, the laminating of melting extrusion and this was made to both sides of a 5 time oriented film of (1), and the laminated film of three layer systems was obtained. Subsequently, after cooling the laminated film of these three layer systems to 60 degrees C, it heats even in temperature of about 160 degrees C again. Extend 7.5 times in a longitudinal direction using a tenter, and annealing processing is carried out at the temperature of 165 degrees C. It cooled even in temperature of 60 degrees C, the slit of the handle part was carried out, and the synthetic paper of the thickness of 80 micrometers (B/A/C=16micrometer / 48 micrometers / 16 micrometers) of three layer systems (uniaxial stretching / biaxial stretching / uniaxial stretching) and 15% of void contents was obtained. In addition, the void contents of each class were (B/A/C=3% / 29.7% / 30%).

[0041] Example After 2 (1) melt flow rates (MFR) kneaded the constituent (A) which mixed 3 % of the weight of high density polyethylene, and 16 % of the weight of calcium carbonates with a mean particle diameter of 1.5 micrometers with the extruder set as 270 degrees C in 81 % of the weight (melting point of about 164-167 degrees C) of polypropylene for 0.8g / 10 minutes, in it, they extruded in the shape of a sheet, cooled with the cooling system in it, and obtained the non-extended sheet in it. And after heating this sheet again even in temperature of 150 degrees C, it extended 5 times to the lengthwise direction.

[0042] (2) After MFR made the constituent (B) which mixed 46 % of the weight of calcium carbonates with a mean particle diameter of 1.5 micrometers with 54 % of the weight (melting point of about 164-167 degrees C) of polypropylene for 4g / 10 minutes knead with another extruder, this was extruded in the shape of a sheet from the die, the laminating of this was carried out to both sides of a 5 time oriented film of (1), and the laminated film of three layer systems was obtained. Subsequently, after cooling the laminated film of these three layer systems to 60 degrees C, it heats even in temperature of about 175 degrees C again. Extend 7.5 times in a longitudinal direction using a tenter, and annealing processing is carried out at the temperature of 165 degrees C. It cooled even in temperature of 60 degrees C, the slit of the handle part was carried out, and the synthetic paper of the thickness of 80 micrometers (B/A/B=20micrometer / 40 micrometers / 20 micrometers) of three layer systems (uniaxial stretching / biaxial stretching / uniaxial stretching) and 15% of void contents was obtained. In addition, the void contents of each class were (B/A/B=4.6% / 13.9% / 4.6%). The physical properties of these synthetic papers (fine porosity film) are shown in a table 1.

[0043]

[A table 1]

合 成 紙	肉 厚 ( $\mu\text{m}$ )	密 度 ( $\text{g}/\text{cm}^3$ )	不透光度 (%)	空孔率 (%)	粗 さ ( $\mu\text{m}$ )				平滑度 (秒)	表面強度 $\text{kg} \cdot \text{cm}$
					最大高さ (SRmax)	中心面 平均粗さ (SRa)	中心面 山高さ (SRp)	中心面 谷深さ (SRv)		
例 1	80	0.830	88	15	7.9	0.31	5.5	2.2	840	3.5
例 2	80	0.851	86	9.3	5.4	0.30	3.1	2.0	900	1.9

[0044] On the front face (B) of these synthetic papers, the antistatic nature primer "SAFUTOMA 1300" by Mitsubishi Petrochemical Co., Ltd. was applied to the thickness of 2 micrometers, on this primer, UV offset ink "FDO-G" (trade name) of Oriental \*\*\*\*\* Manufacture was used, and the trade name, the manufacturer name, the pattern, etc. were printed.

[0045] Example of the example of manufacture of an extrusion-foaming film (a) In the propylene ethylene block-copolymer (MFR:0.5g / 10 minutes "Mitsubishi polypropylene EC 9": trade name) 100 weight section by 3 Mitsubishi Petrochemical Co., Ltd. The mixture 3.5 weight section of 1:1 of a citric-acid monosodium and a sodium hydrogencarbonate is blended as a chemistry foaming agent. It considered as the fizz resin constituent and melting kneading was carried out with the extruder with an aperture of 65mm, subsequently to the inside of atmospheric pressure, from T-die, it was made to extrude and foam, it cooled with a roll, and the foaming film of one 1.5 times the expansion ratio [ the thickness of 0.5mm and ] of this and 81% of rates of a closed cell was obtained.

[0046] example 4 — a line — a low consistency ethylene polymer (MFR:0.7g / 10 minutes "Mitsubishi polyethylene UE320": trade name) (the AZOJIKARUBONAMIDO 2 weight section was blended with the 100 weight sections as a chemistry foaming agent, it considered as the fizz resin constituent, and melting kneading was carried out with the extruder with an aperture of 65mm.) On the other hand, it is 30 % of the weight (MFR:1.8g / 10 minutes "Mitsubishi polypropylene EC 8": trade name) of propylene ethylene block copolymers by Mitsubishi Petrochemical Co., Ltd. said line — 20 % of the weight of talc was blended as 50 % of the weight of low consistency ethylene polymers, and a bulking agent, and melting kneading was carried out with the extruder with an aperture of 90mm. Subsequently, these were made to co-extrude [ they supplied them and ] and foam to one set of a co-extrusion die, and the thickness of a non-foaming layer obtained the two-layer structure film whose thickness of 100 micrometers and a foaming layer is 800 micrometers. It was 1.8 times the expansion ratio of a foaming layer of this, and the rate of a closed cell was 88%.

[0047] Example of preparation of a thermosensitive binder The 5 dicyclohexyl-phthalate 316 weight section, the styrene, maleic-

anhydride, and acrylic-acid n-butyl copolymer solution 53 weight section of 30 % of the weight of concentration, the abietic-acid rosin ester emulsion 158 weight section of 50 % of the weight of concentration, the ethylene-vinylacetate copolymer 184 weight section of 50 % of the weight of concentration, the colloidal silica 160 weight section whose concentration is 20 % of the weight, and the water 120 weight section were mixed, and the opaque white aqueous thermosensitive binder was prepared.

[0048] Example The polyvinyl alcohol 15 weight section whose ethylene-vinylacetate copolymer aqueous emulsion 22 weight section and concentration the 6 dicyclohexyl-phthalate 40 weight section, the abietic-acid rosin ester emulsion 30 weight section of 50 % of the weight of concentration, and whose concentration are 50 % of the weight are 20 % of the weight was mixed, and the aqueous thermosensitive binder was prepared.

[0049] (Example 1) To a reverse front face, the printing side of the synthetic paper obtained in Example 1 is the mixed primer of polyether polyol and the poly isocyanate 1 g/m<sup>2</sup> It applied at a rate, the extrusion-foaming film obtained in Example 4 to this was stuck, and the layered product with a thickness of 581 micrometers was obtained. It is the thermosensitive binder obtained in Example 5 to the foam layer side of this layered product at a part for solid 13 g/m<sup>2</sup> It became, and amount spreading was carried out, it dried at 40 degrees C for 2 minutes, and the thermosensitive binder layer was prepared. This was kept for two days to 23 degrees C and the thermostatic chamber of 55% relative humidity. Subsequently, multicolor gravure of a goods pattern, a trade name, the manufacturer, an ingredients label, the unit price, etc. was carried out on the surface of the synthetic paper, the slit was carried out to width of face of 40mm, the roll volume was carried out to it, and the roll-like object of a DIREDO label was obtained.

[0050] The these rolls-like object was saved for seven days in (i)23 degree C, the thermostatic chamber of 55% of relative humidity and (ii)40 degree C, and the thermostatic chamber of 75% of relative humidity. Subsequently, labeling of the roll-like object of these DIREDO labels was carried out on the adherend (a carboy, tin plate can) using roll labeler LR-401KR (trade name) of Mitsuhiro Automatic Machine on the conditions of 1kg of press of the temperature of 120 degrees C of a heating device, and the DIREDO label to an adherend. The adhesive strength (after [ one day ] progress) to each adherend was as in the following table 2.

[0051] Moreover, the existence of the partial avulsion of printing of the label on the adherend by which labeling was carried out was evaluated in the following four steps.

There is no exfoliation of 0 — printing.

It is 2 1—40cm. Although it hits and there are 1-3 small white omissions, it is completely satisfactory practically.

It is 2 2—40cm. It hits and there are 4-10 small white omissions.

There are those of 3 — printing part for hides in some places, and there is no product value practically.

[0052] Furthermore, it evaluated the rewinding easy (anti-blocking nature) of the DIREDO label at the time of labeling in the following five steps.

There is no 5 — exfoliation resistance.

Although there may be a sound a little at the time of 4 — exfoliation, it is satisfactory practically.

There is continuous a sound at the time of 3 — exfoliation.

Those of the printing part by 2 — blocking for hides can see.

It cannot perform rewinding [ of 1 — roll ].

A result is shown in a table 2. 180ml of alcohol was put into the carboy, this was put in for 15 minutes in the 90-degree C molten bath, 1 \*(ed), and the existence of exfoliation of a label and the existence of deformation by the heat shrink of a label were investigated. Moreover, it investigated whether the heat when having this bottle by hand would give physical pain. A result is shown in a table 2.

[0053]

[A table 2]

		被着材への接着強度 (gf / 40 mm幅)		印刷剥離 程 度	抗ブロッキン グ性の程度	ラベルの 剥離の有無	ラベルの熱収縮 による変形の有無	手への熱さの 伝わり具合
		ガラス瓶	ステンレス缶					
保 管 条 件	(i)	2, 2 1 0	2, 3 7 0	0	5	な し	な し	苦痛でない
	(ii)	2, 1 8 0	2, 2 8 0	0	5	な し	な し	苦痛でない

[0054] (Example 2) What injected the thing of Example 2 instead of the synthetic paper of Example 1 as a synthetic paper, injected the foaming ink made from Osaka Printing ink Manufacture "the foaming ink for olefins" (trade name) as a foam layer, and was formed in the thickness of 0.3mm was used, and also the DIREDO label was manufactured similarly, and labeling was performed. The assessment result of a label is shown in a table 3.

[0055] (Example 3) It is what was obtained in Example 6 as an aqueous thermosensitive binder in the example 1 with a solid daily dose 14 g/m<sup>2</sup> It applied so that it might become, and it dried at 100 degrees C, and also the DIREDO label was obtained similarly, the slit of this was carried out, and it wound in the shape of a roll. This was inserted in the labelling machine after storage in 20 degrees C and the thermostatic chamber of 55% of relative humidity on the 1st, and the tin plate can was made to stick at 100 degrees C of heating devices. Anti-blocking nature is fitness (assessment 5), and did not have exfoliation of printing, either. The bond strength with a stainless steel can was initial 1,600gf / 40mm width of face, and three-day after [ progress ] 2,420gf / 40mm width of face. The assessment result of a label is shown in a table 3.

[0056] In the example 1, the extrusion-foaming film of Example 4 was used instead of the thing of Example 3 as a foam layer, and also the DIREDO label was obtained similarly. The assessment result of a label is shown in a table 3.

[0057]

[A table 3]



	合成紙 の種類	発泡体固	感熱性 粘着剤固	保管条件 (i)		保管条件 (ii)		40℃, 75%RH	燭をした酒瓶の 手での把持性
				印刷剥離の程度*2	抗ブロッキング性*3	印刷剥離の程度	抗ブロッキング性		
実施例 1	例 1	例 3	例 5	0	5	0	5		苦痛を感じない
実施例 2	例 2	発泡体	例 5	0	4	1	4		苦痛を感じない
実施例 3	例 1	例 3	例 6	0	5	0	5		苦痛を感じない
実施例 4	例 1	例 4	例 5	0	5	0	5		苦痛を感じない

\*2 数値が小さい方が優れる。

\*3 数値が大きい方が優れる。

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**DESCRIPTION OF DRAWINGS**

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**[Brief Description of the Drawings]**

**[Drawing 1]** It is the top view of a label machine.

**[Drawing 2]** It is the top view showing some equipments which measure the surface reinforcement of a sheet.

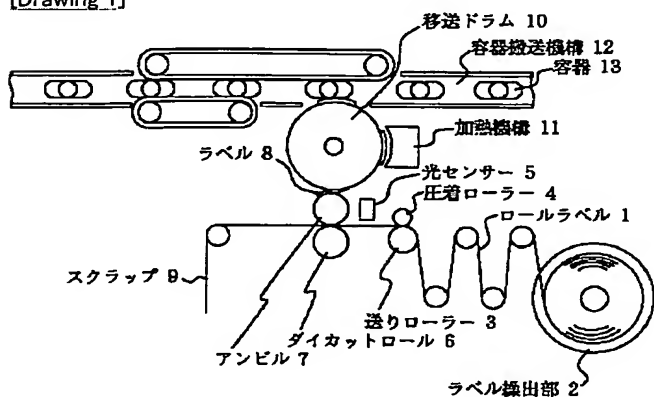
**[Drawing 3]** It is the sectional view of the DIREDO label of this invention.

**[Description of Notations]**

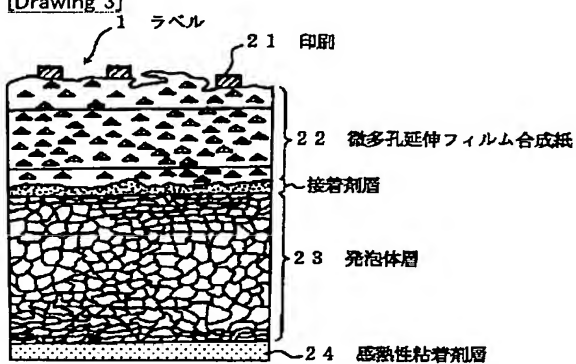
- 1 Roll Label
  - 2 Label Delivery Section
  - 3 Delivery Roller
  - 4 Sticking-by-Pressure Roller
  - 5 Photosensor
  - 6 Die Cut Roller
  - 7 Annville
  - 8 Label
  - 9 Scrap
  - 10 Migration Drum
  - 11 Heating Device
  - 12 Container Conveyance Device
  - 13 Container
  - 20 Scale
  - 21 Printing
  - 22 Synthetic Paper
  - 23 Foam Layer
  - 24 Thermosensitive Binder Layer
-

## DRAWINGS

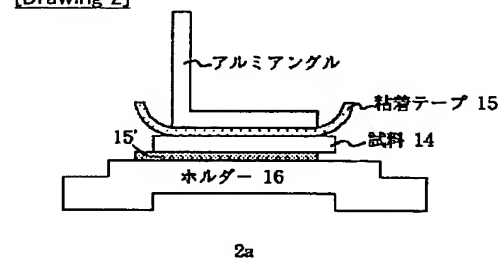
[Drawing 1]



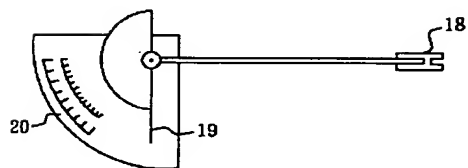
[Drawing 3]



[Drawing 2]



2a



2b

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